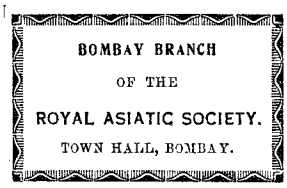
00140562

597.09548
Rus/DeS
1110562



Digitized with financial assistance from
Observer Research Foundation
on 22 February, 2019

DESCRIPTIONS AND FIGURES

OF

TWO HUNDRED FISHES;

COLLECTED AT

VIZAGAPATAM ON THE COAST OF COROMANDEL,

BY

140562
ae

PATRICK RUSSELL, M.D. F.R.S.

PRESENTED TO

THE HON. THE COURT OF DIRECTORS OF THE

EAST INDIA COMPANY,

AND PUBLISHED BY THEIR ORDER,

UNDER THE SUPERINTENDENCE OF

THE AUTHOR.

VOL. II.

LONDON:

PRINTED BY W. BULMER AND CO. SHAKSPEARE PRESS,
CLEVELAND-ROW,
FOR G. AND W. NICOL, BOOKSELLERS TO HIS MAJESTY,
PALL-MALL.

MDCCCIII.

1803

00140562

KOORODTA

INDIAN FISHES.

PISCES THORACICI.

SPARUS.

No. CI.

SPARUS *cauda bifida; pinna dorsi spinis quinque, et radiis septem setaceis longioribus; corpore sub-orbiculato, lineis vittisque roseis.*

The SPARUS with a forked tail; five spines in the dorsal fin, and seven long filiform rays; the body nearly orbicular, with rose colour lines and fillets.

Sparus spinifer Forsk. No. 23.

Called by the Natives KOOROOTA.

B. v. *D.* $\frac{5}{23}$. *P.* 15. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 18.

THE *body* sub-orbicular, compressed; scales compact, tenacious.

The *head* compressed, front very steep, face striated. The mouth low; jaws, teeth, tongue, palate, eyes and nostrils, as usual in this genus. The opercula squamous, and cover the branchial membrane; rendering it difficult to count the ossicles.

The *trunk*. The back arched, carinate; the breast and belly less arched; sides compressed; tail roundish. The lateral line moderately arched to the end of the dorsal fin, then straight to its termination at the upper part of the caudal fin. The anus middle.

The *fins*. The dorsal differs remarkably from that of the usual form. There are first two spiculi in front, then seven setaceous rays, three of which are nearly the length of the body; to these succeed three spinous and eleven ramous rays half an inch long. The pectoral fins long, acuminate in the middle; the ventral shorter, the second ray terminating in a setaceous tail; the anal in shape resembles the hinder portion of the dorsal, but narrower; the caudal bifid.

The *colour*. The colour stone white, with pale reddish, curve lines, above the lateral line, and straight fillets of the same colour under it; the belly and throat white; the fins a faint reddish yellow.

The membrane of the dorsal fin remarkably thin and tender.

* For the Generic Character, see Vol. I. p. 71.

No. CII.

SPARUS *cauda sub-lunata; spinis ventralibus duabus, analibus septem; corpore lato-ovale, micro-lepidoto, lineolis punctisque cyaneis.*

The SPARUS with a sub-lunate tail; two ventral spines, and seven anal; a broad oval body with small scales, and short azure lines and dots.

Sparus spinus Linn. S. N. p. 471?

Called by the Natives WORAHWAH.

B. 5. *D.* $\frac{13}{23}$. *P.* 17. *V.* $\frac{2}{5}$. *A.* $\frac{7}{16}$. *C.* 20.

THE *body* oval, compressed, squamous; scales very small, imbricate, tenacious.

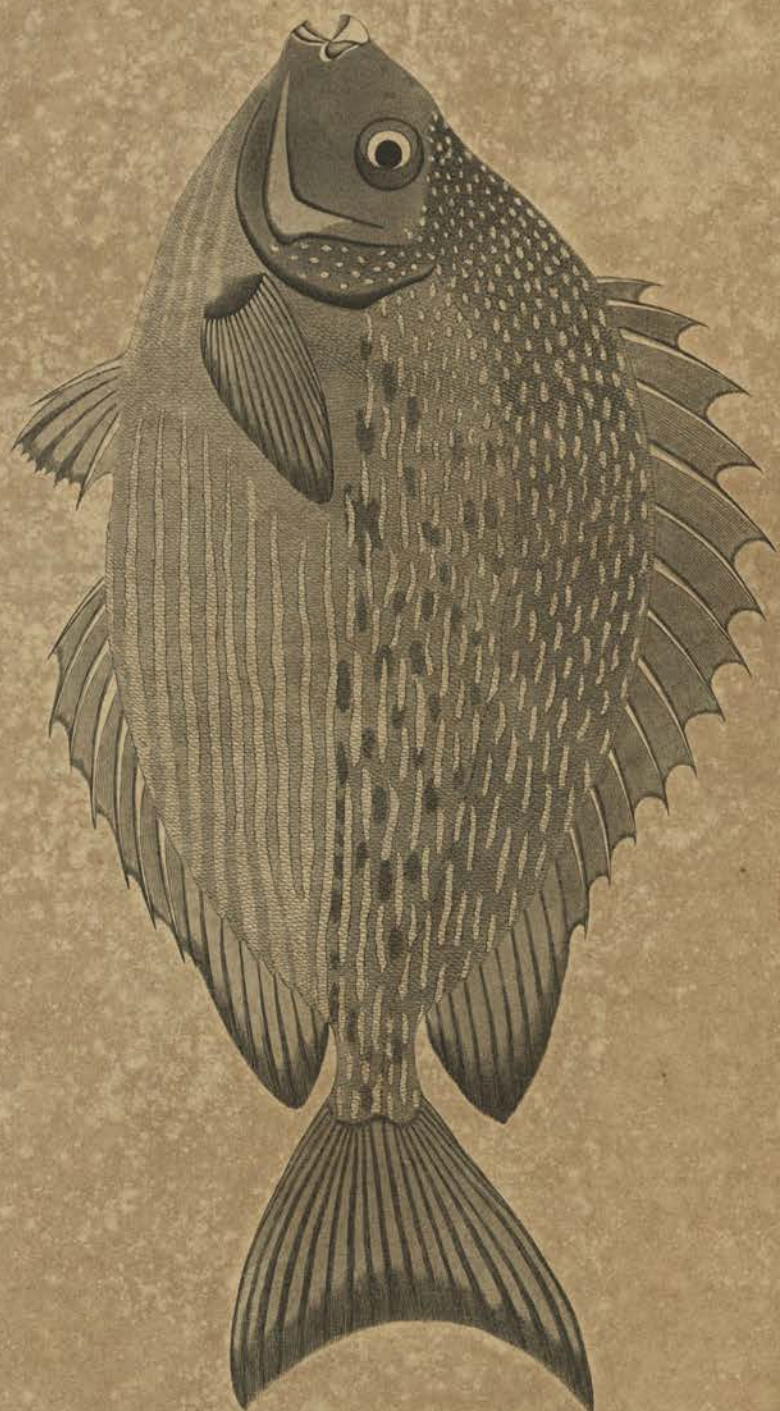
The *head* small, oval, compressed, without scales, the front depressed. The jaws projecting, form when shut a short rostrum; the mouth very small, roundish; no lips. Jaws extractile, of equal length; teeth equal, numerous, small, sharp. The tongue thick, smooth, immoveable. Palate narrow, smooth. Eyes high, large, orbicular: the anterior edge of the orbit somewhat rough. Nostrils double, distant from the eye and from each other, the hinder largest and oval. The opercula consist of three laminæ, smooth, not serrated; the branchial membrane covered; the aperture very small.

The *trunk*. The back, breast, and belly arched; the sides compressed; the tail small, roundish. The lateral line hardly discernible, curved, supreme. The anus nearer the head than the tail.

The *fins*. The dorsal occupies the whole of the back, the spinous rays arched, the posterior part of the fin round pointed; the anal is of the same form, but has seven spinous rays; the pectoral very low, the length of the head, acuminate above; the ventral short, remarkable for having two spinous rays, one on each side; the caudal long, and lunate.

The *colour*. The upper part of the head and lower opercula brown, with an obscure mixture of green, and powdered with pale blue dots, the cheeks of a sulphur yellow. The back and sides a dark brown, with blue dots, oval spots, and short lines, but towards the belly, with parallel fillets blue, and reddish brown, alternately; the breast slightly tinged of a dark orange. The pectoral fins are of a light colour, all the others dark, streaked here and there with orange.

	Inches.	Lines.
Length, from the rostrum to the caudal fin	9	0
caudal fin	2	6
Greatest breadth	4	6



WORAHWAH.

WORAHWAH.

SILLANEROO KUNTEE.

No. CIII.

SPARUS *cauda sublunata; corpore lato-ovale, alepidoto, cute coriaceo tecto; spinis pinnæ analis septem, pinnæ ventralis duabus: aculeo parvo recumbente ante pinnam dorsalem.*

The SPARUS with a sub-lunate tail; a broad oval body, without scales, and covered with a coriaceous skin. Seven spines in the anal fin, and two in the ventral: a recumbent small spine before the dorsal.

Called also by the Natives WORAHWAH.

B. v. *D.* $\frac{13}{23}$. *P.* 17. *V.* $\frac{2}{5}$. *A.* $\frac{7}{16}$. *C.* 20.

THIS species agreeing so nearly with the one last described, it will be sufficient merely to mention the circumstances, in which they differ.

The *body* is covered with a coriaceous skin, without any visible scales. The head is more declivous and sharp, resembling that of a Balistes. There is a recumbent spine pointing forwards, in front of the dorsal fin: and in both dorsal and anal fins, the skin on each side forms a groove for the roots of the ossicles.

The *colour* of the breast and belly a dull white, all the rest almost black, marbled with dusky brown, and dull yellowish streaks.

Length, including the caudal fin, seven inches.

No. CIV.

SPARUS *capite aculeato, oculis permagnis; corpore ovato compresso, squamis largis, pectinatis, tecto; radii octo in pinna ventrali, spinæ anales quatuor; spiculis quinque ad latera caudæ bifidæ supra subterque.*

The SPARUS with a prickly head, and very large eyes; an ovate body, covered with large pectinated scales; eight rays in the ventral fin, and four spines in the anal; the tail bifid, and on each edge, above and below, are five reflex spiculi.

Called by the Natives SULLANEROO KUNTEE.

B. vii. *D.* $\frac{11}{25}$. *P.* 15. *V.* $\frac{1}{8}$. *A.* $\frac{4}{16}$. *C.* 20.

THE *body* ovate, compressed; scales large, pectinated.

The *head* large, the crown striate and channeled; the cheeks striate, or covered with pectinated scales, and there is a pectinate semi-circle under the orbit. The mouth very wide; jaws long, extractile, unequal, the under one longest, with a few spiculi at the extremity. The teeth very small. The eyes uncommonly large, orbicular, stained deep red on the upper part. Nostrils round, small, close together, in a dent between the orbit and the nose. Tongue sharp-pointed. Opercula serrate, and each lamina has one or two spiculi. The branchial membrane half exposed.

The *trunk*. The back gently arched from the crown to the end of the dorsal fin, where the tail becomes small and roundish, but again expanding to receive the fin, is armed on each edge with small, reverted, spiculi.

The lateral line bends gently, not parallel with the arch of the back, and terminates not exactly in the middle of the caudal fin. Anus remote.

The *fins*. The dorsal spines in a groove; the posterior portion of that fin and the anal, as well as the pectoral and ventral fins, acuminate above; the caudal bifid. The first anal spine very small, the third remarkably strong.

The *colour*. The head and back of a deep red, the sides striped longitudinally with white, red, and pearl fillets. The fins light gray, tipped with red.

The *length*, including the caudal fin, seven inches.

No. CV.

SPARUS *capite aculeato, oculis permagnis; corpore oblongo, lato, compresso, squamis largis, asperis, striatis et pectinatis; radii octo in pinna ventrali; spinis analibus quatuor; cauda bifida, spiculis quatuor ad latera, supra subterque.*

The SPARUS with a prickly head, and very large eyes; an oblong, broad, compressed body, covered with large, rough, striated, pectinated scales; eight rays in the ventral fin, four anal spines. The tail bifid, and on each edge, above and below, are four reflex spiculi.

Called by the Natives BOTCHE.

B. viii. *D.* $\frac{11}{25}$. *P.* 15. *V.* $\frac{1}{8}$. *A.* $\frac{4}{10}$. *C.* 21.

THIS species is particularly distinguished by the spinous head and scales; large eyes, eight rays in the ventral fin; and spines on the edges of the tail.

The *body* oblong, remarkably broad at the shoulders, compressed, covered with large, strong, bony scales, striate, pectinate, imbricate, tenacious.

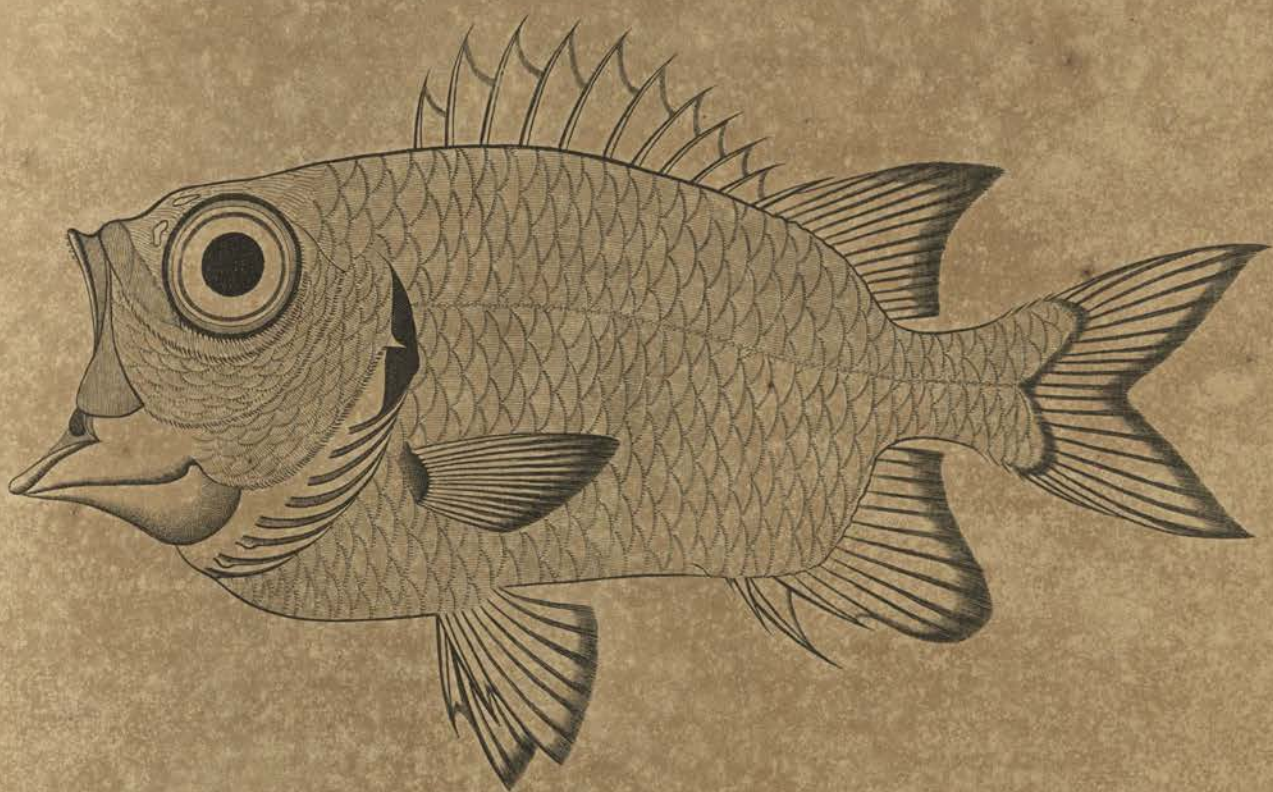
The *head* large, compressed; the front short, the crown rough, channeled; the orbit half surrounded with a double row of short spiculi, and the scales, as on the trunk, serrate. The mouth very wide; no lips; the jaws long, bare, striate on the outside, the upper longest, emarginate. Teeth in several rows, small, orbicular, rough. Tongue short, ovate, rough, bridled. The palate wide, rough on the fore part. Eyes supreme, extremely large, orbicular. Nostrils large, oblong.

The opercula serrate, and a flat spine on the edge of the posterior lamina. The branchial membrane much exposed; it has eight ossiculi, of which the two inferior are small and rough; the aperture wide.

The *trunk*. The back a little round, but convex, towards the tail carinate; the breast and belly prominent; the sides compressed, yet roundish: the shoulders broad, and the body contracts but little till near the anal fin, where it diminishes abruptly. The branchiæ consist of four laminæ, the two exterior pectinate, the interior denticulate. The lateral line high, almost straight. Anus remote.

The *fins*. The dorsal spines in a groove, the hinder portion of the fin acuminate in the middle; the pectoral low, short, acuminate above; the ventral as long as the pectoral, and remarkable for having eight rays; the anal resembles the opposite dorsal; the caudal fin bifid, with spiculi at the edges.

The *colour*. The head red; the membranous margin of the posterior lamina of the operculum the colour of black, coagulated blood; the breast and belly a yellowish red, mixed with white; the scales on the trunk,



BOTCHE.

N°

KURITE

whitish, with red edges. The dorsal, anal, and caudal fins, of the same colour with the head, but edged with white, and tipped black; the pectoral and ventral, pale pink.

	Inches.	Lines.
Length from the rostrum to the caudal fin - - - - - -	8	0
caudal fin - - - - - - - - - - - -	2	0
Greatest breadth - - - - - - - - - - - - - -	3	8

No. CVI.

SPARUS *cauda bifida; spinis dorsalibus decem; lamina aculeata, serrata, infra orbitem; operculis serratis.*

The SPARUS with a forked tail; ten dorsal spines; the opercula serrated; and a serrated lamina armed with a spine under the orbit.

Called by the Natives KURITE.

$B.$ v. $D.\ \frac{10}{21}$. $P.$ 16. $V.\ \frac{1}{6}$. $A.\ \frac{3}{11}$. $C.$ 18.

THE *body* ovate, compressed; the back arched, the breast and belly convex; the tail narrow.

The *head* declivous, compressed, squamous. Mouth small; lips rather thick; teeth numerous, very small, close. Eyes very large, oval. Nostrils oval. Under each orbit a squamous lamina armed above with a flat curve spine, the lower edge serrated; two lamellæ at the rise of the lateral line, the upper semicircular, which as well as the anterior lamina of the operculum were likewise serrated.

The lateral line high, arched, parallel tc the back, conspicuous, but not carinate. The anus remote.

The *colour*. The head and back a darkish red, with an intermixture of yellowish green; the breast light coloured; the belly white with a slight yellow cast; the fins of a golden yellow.

The *length* of the subject eight inches.

REMARKS.

The two fish immediately preceding the subject just described, (No. CIV. and CV.) belong indisputably to the genus Holocentrus of Artedi: the eight ventral rays, and the spiculi on each edge of the caudal fin, sufficiently denote them. Though these characters are wanting in the present subject, there are others besides the big eye, which seemingly indicate an affinity.

It may be further remarked, that of the Holocentri described by Bloch, the first excepted, none have caudal spiculi, nor eight ventral rays: and the first only has eight branchial ossicles.

No. CVII.

SPARUS *cauda bilobata; spinis mollibus pinnæ dorsi undecem; corpore lanceolato, vittis subrubris et flavis, alternè.*

The SPARUS with a tail unequally divided; eleven soft spines in the dorsal fin; the body lanceolate, with alternate reddish and tawny fillets.

Called by the Natives LAMA GULIMINDA.

B. v. *D.* $\frac{11}{19}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{1}{10}$. *C.* 21.

THE *body* lanceolate, compressed; scales large, rounded behind, but the anterior edge truncate, which is not uncommon.

The *head* ovate, compressed, the rostrum obtuse, the front a little depressed, the face striated; the mouth rather small; the teeth straight, regular, numerous. The tongue and palate smooth; the eyes high, backward, rather oval; the nostrils double, in a furrow near the orbit.

The squamous opercula consist of three laminæ, moveable, but hide the membrane.

The *trunk.* The back very little assurgent and slopes very gradually to the tail; the belly almost straight. The lateral line at first arched a little above the pectoral fin, descends afterwards parallel to the back; the anus middle.

The *fins.* The spinous part of the dorsal arched, the hinder part ascending; the pectoral middle, short, acuminate above; the ventral with a setaceous tail; the anal like the ramous part of the dorsal to which it is opposite: the caudal bilobed, the upper lobe longest.

The *colour.* The head and back have a reddish cast; the sides cinereous, with narrow fillets alternately pale red, and faint yellow; the throat and belly a bright silver; the dorsal and caudal fins nearly the colour of the back, the other fins whitish.

The *length*, ten inches.

REMARKS.

The fish is firm and of good flavour, somewhat resembling the red mullet, and goes by the name Guliminda among the fishermen.

No. CVIII.

SPARUS *cauda bilobata; spinis dorsalibus septem; corpore ovato-oblongo, alepidoto, albescente, dorso versicolore; macula nigra ad opercula; pinnis dorsalibus duabus.*

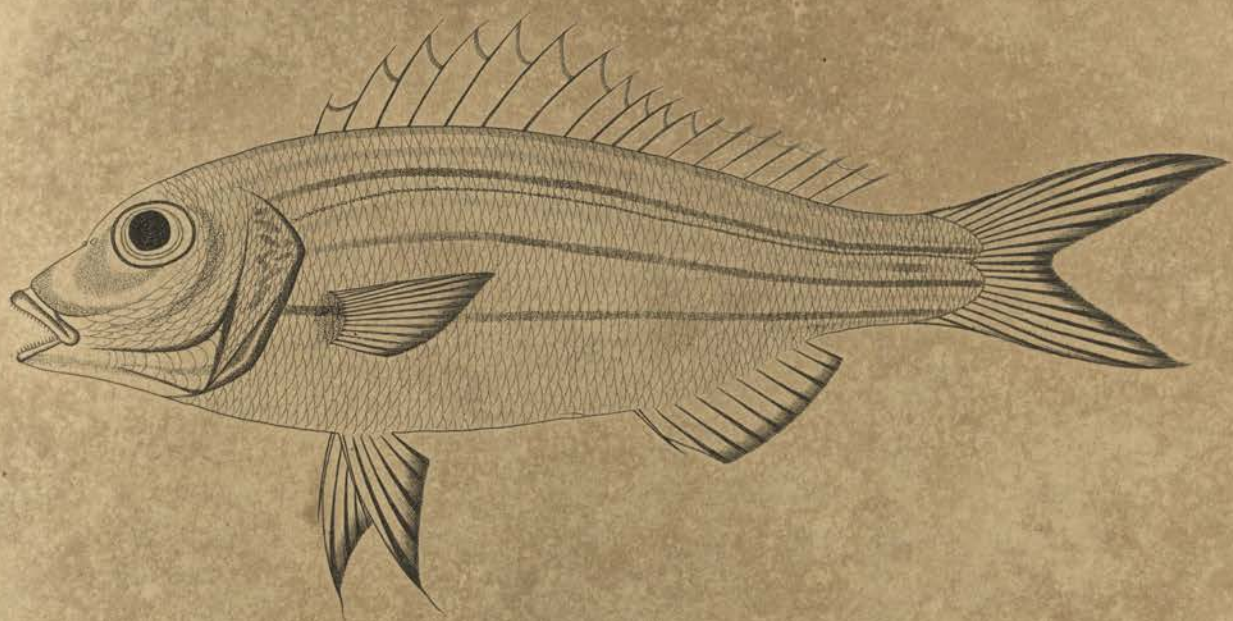
The SPARUS with a bilobed tail; seven dorsal spines; the body ovate-oblong, without scales, whitish, the back of changeable colours: a small black spot on the operculum. Two dorsal fins.

Called by the Natives CHUNDAWAH.

B. vii. *D.* 7.—23. *P.* 16. *V.* 6. *A.* 26. *C.* 18.

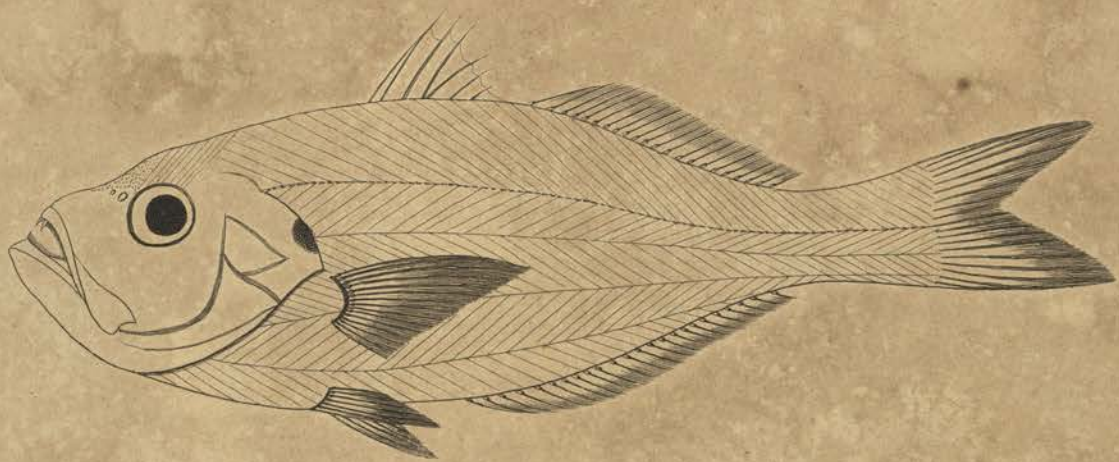
THE *body* ovate-oblong, compressed; no scales perceptible, skin striated, polished, whitish, resplendent.

The *head* ovate, compressed; the front convex, face smooth; the mouth oblique, large; the lower jaw longer than the upper, rises obliquely; the tongue small, smooth, moveable; palate rough. The eyes nearly



LAMA GULIMINDA

R



CHUNDAWAH Kuk kum?

POTTEE KANASAH

middle, large, round, iris pearl. Nostrils high, between the upper edge of the orbit and the front. The opercula two-leaved, with a black spot on the upper edge of the hinder lamina: the membrane easily discerned.

The lateral line somewhat carinate, a little arched, but less than the back. The anus middle.

The *fins*. Two dorsal, the one scapular of seven spines, the other lumbar, ramous, slender; the pectoral short, acuminate at the top; the ventral still shorter, acuminate at the middle; the anal longer than the opposite dorsal, but like it in form, and has two very small obscure spines, at its rise; the caudal unequally divided into two lobes, of which the under is the largest.

The *colour* a glossy white, but the back, like mother of pearl, reflects a variety of colours. The second dorsal, the anal, and caudal fins, have somewhat of a yellowish cast.

The *length*, nine inches.

The fish is of a very indifferent quality, being flabby and insipid.

No. CIX.

SPARUS? *cauda integra acuminata; spinis dorsalibus undecem; corpore lanceolato, versicolore, resplendente.*

The SPARUS with a tail undivided, acuminate in the middle; eleven dorsal spines; a lanceolate body, of changeable colours and resplendent.

Called by the Natives POTTEE KANASAH.

B. vii. *D.* $\frac{10}{10}$. $\frac{1}{21}$. *P.* 17. *V.* 6. *A.* 9. *C.* 16.

THE *body* oblong-lanceolate, compressed; scales close, ciliate, a little rough, tenacious.

The *head*, large, ovate, compressed, squamous, the front flattish. The mouth very wide, somewhat oblique; the upper jaw longest. Teeth as represented in the figure. Tongue ovate, thin at the point, smooth, moveable; palate tuberculate, throat denticulate; eyes high, near the rostrum, middle size, somewhat oval. Nostrils near the orbit, oval.

Opercula large, of three laminæ, squamous, the anterior sub-serrated, the posterior acuminate. The branchial membrane half covered; the aperture proportional.

The *trunk*. The back carinate, rises a little at the dorsal fin and is then gently arched; the sides compressed, but convex; the belly slightly convex; the tail compressed, carinate above; the lateral line raised, conspicuous, rising from the upper edge of the opercula, at first a little arched, then descending (not parallel to the back) it runs straight to the middle of the caudal fin. The anus remote.

The *fins*. The dorsal interrupted; appears at first to be double, the anterior portion composed of declining, soft spines, the posterior, of ramous rays, nearly equal; the pectoral long, acuminate at the middle; the ventral short, has no spine, acuminate at top; the anal also remarkably short, rounded; the caudal acuminate at the middle, and remains distended after death.

The *colour* of the upper part of the head, and the back, green, dark blue, and golden, beautifully changing; the rest, below the line, pearl. The fins light, with a yellow cast.

The *length*, including the caudal fin, one foot two inches; the breadth, three inches and a half.

No. CX.

SPARUS *cauda sub-integra; spinis dorsalibus decem; corpore quinque vittis cæruleis, macula magna, ovale, sub-cærulea, ad lineam lateralem.*

The SPARUS with a tail nearly entire; ten dorsal spines; five sky blue longitudinal bands on the side, and a large, oval, bluish mark on the lateral line.

Called by the Natives MUNGI MUPUDEE.

B. vi. *D.* $\frac{10}{24}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{3}{11}$. *C.* 18.

THE *body* in this species is between ovate and oval; scales large.

The *head* declivous, vertex rough, front smooth, a little convex, the face without scales. The mouth, jaws, lips, and tongue as usual in the genus. The teeth in the fore part of both jaws crowded in several rows. There are teeth also in the palate. The eyes superior, oval. Nostrils distant from each other and from the orbit. The opercula squamous, the lower angle of the anterior lamina serrate, the posterior lamina acuminate. The branchial membrane half discovered.

The back arched, the belly straight; the sides compressed and convex; the tail broad. The lateral line high, but less arched than the back. Anus nearly middle.

The spinous portion of the dorsal fin arched, the ramous rounded at the point. The pectoral fin very low, long, acuminate above; the second ray of the ventral setaceous; the anal in shape like the dorsal, and two of its spines remarkably strong; the caudal almost intire.

The general *colour* a light gray; the front reddish, and five narrow light blue fillets, run from the front along the trunk; the belly is of a yellowish white; and above the lateral line, but touching it, is a pale bluish, oval spot. The fins are of a faint yellow, edged with orange.

The *length*, ten inches.

No. CXI.

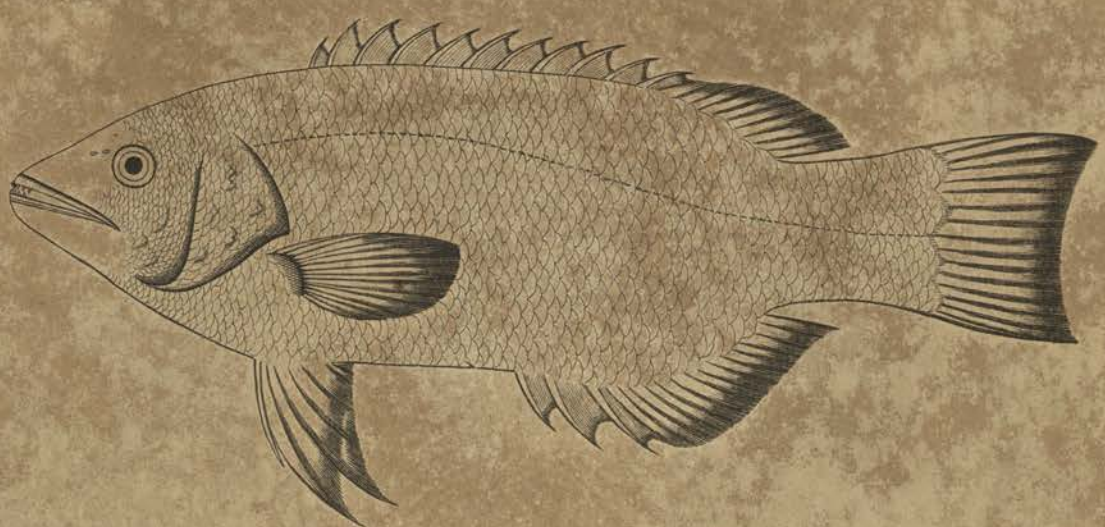
SPARUS *cauda integra parum acuminata; rostro obtuso; linea laterali sub-arcuata, conspicua.*

The SPARUS with an undivided tail, slightly pointed; an obtuse rostrum; the lateral line somewhat arched, conspicuous.

Called

B. v. *D.* $\frac{11}{40}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{2}{10}$. *C.* 15.

MUNGI MIPUDEE



SORING

No. CXII.

SPARUS *cauda lunulata; capite ovato, acutiusculo; spinis analibus tribus.*

The SPARUS with a lunulate tail; an ovate, rather sharpish head; and three anal spines.

Called

B. . *D.* $\frac{11}{22}$. *P.* 15. *V.* $\frac{1}{6}$. *A.* $\frac{3}{18}$. *C.* 17.

REMARKS.

The descriptions of No. CXI. and CXII. having, by some accident been lost, it was not in my power to give more than merely the specific characters.

No. CXIII.

SPARUS? *capite sub-anguloso; rostro elongato, obtuso; cauda emarginata; pinnis dorsalibus duabus.*

The SPARUS with a head somewhat angular; an elongated, obtuse rostrum; the tail emarginate; two dorsal fins.

Called by the Natives SORING.

B. vi. *D.* $\frac{11}{11}$. 23. *P.* 15. *V.* 6. *A.* 23. *C.* 18.

THE *body* lanceolate, somewhat roundish, pellucid; scales large, close, ciliate, rough to the finger when stroked upwards.

The *head* oblong-ovate, smaller than the body, somewhat angular; naked, smooth, except the front of the rostrum, which is squamous, and has a long groove on each side. The mouth small, roundish; hardly any lips. Jaws extractile, short, the inferior much shorter than the upper. Teeth very small, setaceous, and, except in old subjects, the jaws seem only rough like a file. No tongue visible. Palate narrow, the forepart rough like the jaws, the rest smooth. The eyes high, remote from the point of the rostrum, large, round, iris yellow. Nostrils in the groove near the orbit, double, the posterior largest. The three laminæ of the opercula, squamous, the anterior a little serrate, the middle scabrous, the posterior moveable.

The branchial membrane thin, half covered; aperture arched, lateral.

The *trunk*. The back straight, but a little convex, the hinder part carinate; the belly and throat rather prominent; sides and tail compressed. Lateral line high, curves gently to the middle of the tail, then straight, middle. Anus nearly central.

The *fins*. Two dorsal, the first scapular, consists of eleven soft spines, the first ray one inch and two thirds in length, the last one third of an inch; the posterior fin declines also, and reaches nearly to the tail; the pectoral low, short, acuminate at top; the ventral, the length of the pectoral, but broader, has no spinous ray. The anal fin of the same form with the second dorsal, but broader; the caudal distant, sub-bifid.

The *colour*. The crown and rostrum a faint reddish purple, the rest of the face a pale orange; the trunk a

still paler, with a faint greenish cast on the back; the sides, in younger subjects, powdered with very small black dots. The belly a dull pearl. The first dorsal fin light colour, the second of the colour of the body: both have regular rows of black spots on the anterior edges of the spines. The pectoral, ventral, anal, and caudal fins have a very slight yellowish cast.

The *colour* in older subjects is lighter; the body becomes less transparent, and the spots on the fins are often absent.

The *length*, fourteen inches.

REMARKS.

This, known to the English under the name of Whiting, is rather a more delicate fish, and certainly a different genus. It is placed doubtfully under the present genus; and, as well as some of the following subjects, may perhaps belong more properly to the genus Sciæna.

They are caught chiefly near the mouth of the river. The most common size is under that of the fish described: but they are sometimes brought of twenty inches.

In figure it has some resemblance to the Perca Zingel.*

No. CXIV.

SPARUS? *cauda lunata; spinis quinque dorsalibus; corpore sub-dolabriforme, pinnis squamosis.*

The SPARUS with a lunate tail; five dorsal spines; the body somewhat of a hatchet form; the fins squamous.

Called by the Natives MANGULA KUTTI.

B. vii. *D.* $\frac{5}{15}$. *P.* 18. *V.* $\frac{1}{6}$. *A.* $\frac{3}{42}$. *C.* 19.

THE *body*. The scales rising so high on the dorsal and anal fins, contribute to give the fish an unusual form. The scales long, close, imbricate, above the line ciliate.

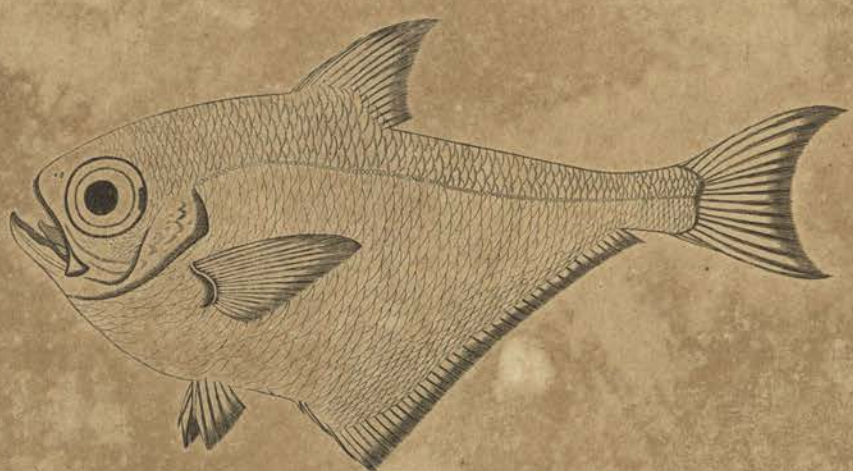
The *head* short, compressed, rostrum obtuse. Mouth large, oblique, without lips. Jaws extractile, equal, the upper emarginate. Teeth very small, numerous, linear, sharp. Tongue awl-shape. Palate wide, smooth. Eyes enormously large, orbicular. Nostrils double, small, middle between the orbit and rostrum.

The first lamina of the opercula squamous, the second striate and acuminate; the branchial membrane half exposed when the mouth is shut; the aperture large, lateral, and gular.

The *trunk*. The back at first slightly arched, afterwards straight; the breast and belly carinate, but prominent; the sides gradually compressed, the posterior part of the trunk spreads in a singular manner, forming an irregular angle, the lower side carinate. The branchiæ consist of four leaves, the exterior pectinate, the other tuberculate. The lateral line supreme, conspicuous, rises in a low arch, from the edge of the opercula, then runs straight from the pectoral fin, parallel to the back. Anus nearer the head than the tail.

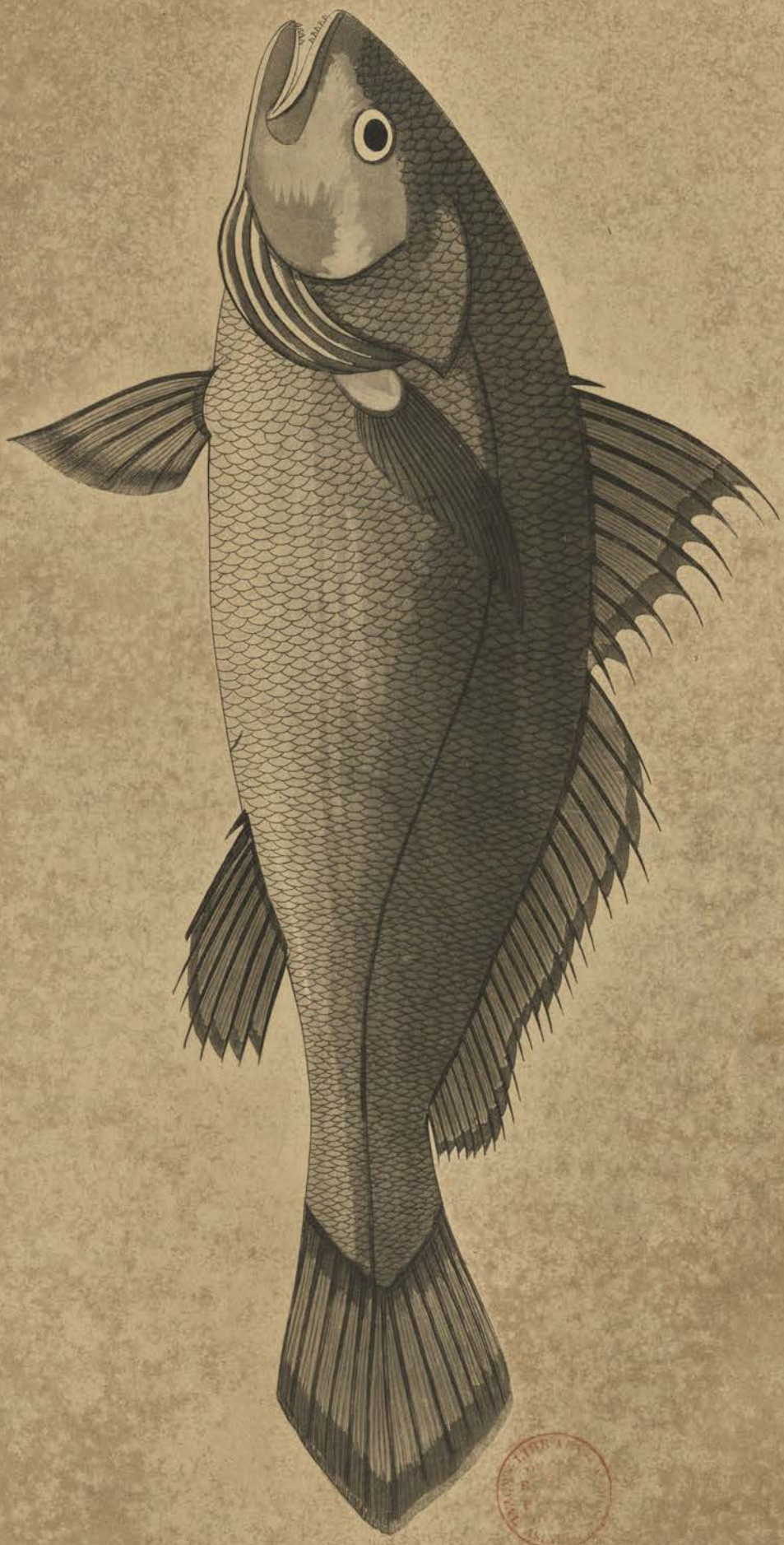
The *fins*. The dorsal on the middle of the back, small, assurgent in front, behind somewhat crescent-form; the pectoral nearly middle, acuminate at top; the ventral of the same form, but very small; anal long, rising a little behind the anus, occupies the whole inferior side of the tail, assurgent (like the dorsal) in front, then declining, but not falcate; the caudal lunulate fin remains extended after death.

* Bloch, Tab. 106.



MANGULA KUTTI.

N°



NALLA KATCHELEE

The *colour* generally reddish, with an obscure mixture of gold. The fins of a yellowish red.

The *length* six inches and a half.

REMARKS.

In White's Journal,* there is the figure of a fish reckoned a Sparus, that bears a strong resemblance to the present subject.

The situation of the dorsal fin is a remarkable character, and suggested an idea of the new genus Kurtus,† from which however, besides being a thoracic, not a jugular fish, it differs in other essential characters.

LABRUS.

GENERIC CHARACTER.

Caput: dentes acuti. Labia simplicia. Membrana branchiostega radiis sex. Opercula squamosa.

Corpus: pinnæ dorsalis radii postice ramento filiformi aucti; pectorales acuminatæ. Linea lateralis recta.

The head: the teeth sharp; lips simple; six rays in the branchial membrane; the opercula squamous.

The body: the rays of the dorsal fin furnished on the posterior edge, with membranous filaments. Pectoral fins acuminate; lateral line straight.

No. CXV.

LABRUS *cauda pentagona; corpore ovato-lanceolato, cinereo-obscuro; pinna dorsali interrupta.*

The LABRUS with a pentagonal tail; an ovate-lanceolate body, of a dark cineritious colour; and the dorsal fin interrupted.

Called by the Natives NALLA KATCHELEE.

B. vii. *D.* $\frac{11}{35}$. *P.* 18. *V.* 6. *A.* $\frac{2}{9}$. *C.* 18.

THE *body* ovate-lanceolate, compressed; scales large, roundish, edge membranous, base striate, imbricate, tenacious; smaller above the line than on other parts.

The *head* small, ovate, compressed, declivous, squamous, cheeks bare. The mouth large, a little oblique; lips thick, covering the teeth. Jaws extractile, the upper somewhat longer than the under. Teeth in a regular row, distant, recurve, short. The tongue large, oblong, subtriangular, obtuse, sheathed, smooth, free. The

* Journal of a Voyage to New South Wales, Lond. 1790. † Bloch, Part V. p. 98.

palate a little tuberculate. The eyes middle, forward, oval, prominent. Nostrils near the orbit, and near each other, round, equal. The posterior lamina of the opercula squamous, acuminate. Branchial membrane half covered; the aperture wide.

The *trunk*. The back carinate, arched; the sides convex, compressed; the belly convex. The tail thin, roundish. The lateral line conspicuous, at first high, arched, then straight to the middle of the caudal fin. The anus remote.

The *fins*. The dorsal solitary, composite, interrupted, consisting of one short, and ten long, soft, declining spines, with twenty four soft assurgent rays: the whole ramentacious. The pectoral long, falcate: the ventral shorter than the pectoral, without a spine; the anal has two spines, and its seven rays exceed in length those of the dorsal; the caudal broad, angular, and pointed.

The *colour*. The prevalent colour a dusky gray; the head and back have a cast of dark blue; the sides near the belly, the belly and throat, cinerious. The fins are darker than the back, but in some places have an obscure cast of yellow. There are sometimes in smaller subjects, a few black spots on the dorsal fin.

The *length*, two feet six inches.

REMARKS.

This fish is esteemed, and, in like manner as the red Sparus, is caught by hook and line in deep water. It begins to appear after the middle of February.

No. CXVI.

LABRUS *cauda pentagona; corpore ovato-lanceolato, maculato.*

The LABRUS with a pentagonal tail; and an ovate-lanceolate, speckled body.

Called by the Natives KATCHELEE.

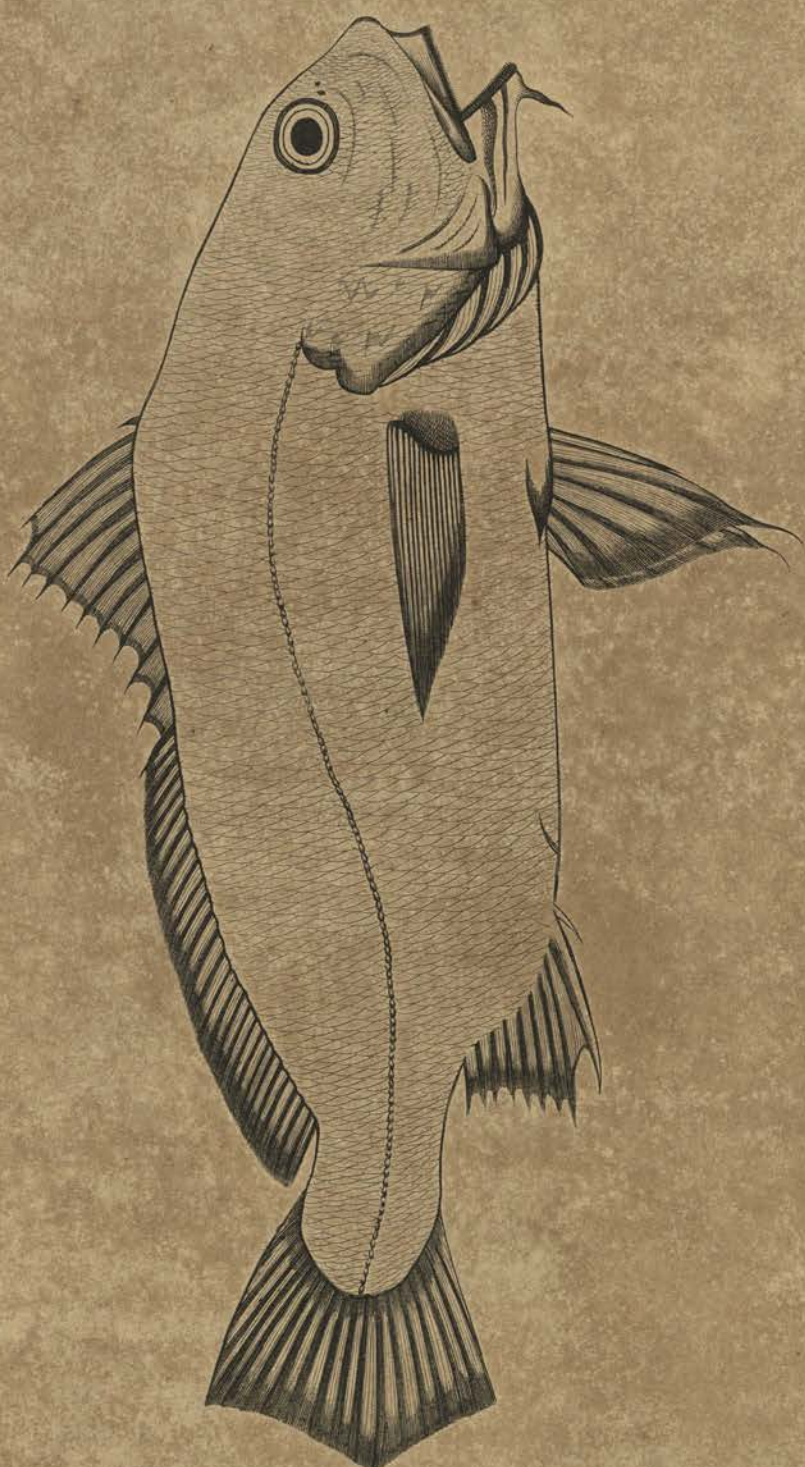
B. vii. *D.* $\frac{11}{35}$. *P.* 18. *V.* 6. *A.* $\frac{2}{9}$. *C.* 18.

THIS does not differ in any material respect from the fish last described. It is universally of a darker colour, the back and shoulders are spotted, with numerous black, oval spots; and the pectoral, ventral, and anal fins are nearly quite black. The dorsal and caudal fins are constantly spotted, which is not the case in the last fish, though of equal size.

The fishermen conceive it to be the female, and give it the same name.

KATCHELEE.

TELLA KATCHELEE.



QUALAR KATCHELEE

No. CXVII.

LABRUS *cauda pentagona; corpore oblongo-ovato, dorso versicolore; spina anali secunda robustiore.*

The LABRUS with a pentagonal tail; an oblong ovate body, of changeable colour on the back; and the second anal spine long and thick.

Called by the Natives TELLA KATCHELEE.

B. VII. *D.* $\frac{11}{41}$. *P.* 16. *V.* 6. *A.* $\frac{2}{10}$. *C.* 18.

THIS species agrees with the description of the black Katchelee, No. CXV. differing only in a few circumstances besides the colour. The body is broader at the shoulders, and the tail less slender; the dorsal fin is less ramentacious, and the soft rays more numerous; the pectoral shorter, broader, and less falcate; the second spine of the anal fin much longer and grosser.

The *colour* of the head (which is less squamous than in the other) and of the back, darkish, but changeable like a pigeon's neck; below the line the colour grows lighter and glossy, and the belly is of a rich pearl; the dorsal fin darkish; the others and lower part of the caudal fin yellowish.

The *length*, one foot eight inches.

No. CXVIII.

LABRUS *cauda pentagona corpore oblongo; capite toto squamoso, rostro obtuso; cirro unico ad maxillam inferiorem.*

The LABRUS with a pentagonal tail; an oblong body; the head entirely squamous, the rostrum obtuse, and a solitary cirrus pendent from the lower jaw.

Called by the Natives QUALAR KATCHELEE.

B. vii. *D.* $\frac{12}{39}$. *P.* 15. *V.* $\frac{1}{6}$. *A.* $\frac{3}{10}$. *C.* 18.

THIS fish under the name of Katchelee, differs more remarkably from the one first described.

The *body* is oblong; the scales smaller.

The *head* shorter, squamous; rostrum shorter, more obtuse. The mouth small, round; teeth very slender; the eyes supreme, oval, large; nostrils double, small, close to the orbit; the posterior oval. A solitary cirrus at the lower jaw.

In other respects it agrees; as likewise in the shape of the lateral line, position of the anus, and shape of the fins.

The *colour* has been omitted in my original description.

The *length*, ten inches.

It is rather a rare fish.

No. CXIX.

LABRUS *pinna caudali medio sub-truncata; maxillis apice bipartatis; linea lateralis ramosa, interrupta; pinnis vittis cæruleis.*

The LABRUS with the tail somewhat truncate in the middle; the maxillæ divided at the point; the lateral line ramous, and interrupted; pale blue fillets on the dorsal, anal, and caudal fins.

Called by the Natives SAHNEE MOIA.

$B.$ v. $D.\frac{10}{21}$. $P.$ 15. $V.$ 6. $A.\frac{2}{11}$. $C.$ 16.

THE *body* oblong, compressed, most beautifully coloured; scales remarkably large, somewhat triangular, tenacious, the posterior edge rounded and striate.

The *head* large, rounded, compressed, and mostly naked; the front convex, smooth. The mouth middle, not large, transverse; lips thickish, blue. Jaws not extractile, equal, divided in the middle, as in the Tetraodon, rough in the inside, the margin somewhat serrate, and the outside tuberculate. Tongue ovate, fleshy, immoveable. Palate smooth. Eyes high, backward, small, orbicular, beautifully coloured, not prominent. Nostrils nearer the orbit than the rostrum, very small, oval.

Opercula squamous, the posterior bluntly pointed, ciliate. Branchial membrane concealed; aperture large, arched, lateral, and gular.

The *trunk*. The back and belly convex; the sides and tail compressed. Lateral line, at its origin from the upper part of the opercula, a very little arched, afterwards descends obliquely to near its termination at the middle of the caudal fin. Anus nearly middle, somewhat prominent.

The *fins*. The dorsal long, not broad, occupies the whole of the back from the shoulder to within an inch of the caudal fin. It consists of 19 or 21 rays, of which nine resemble spines, but are soft and club-pointed; the others ramous: all are assurgent. The pectoral fins low, short, broad, acuminate at top. The ventral shorter, without any distinct spine; the anal assurgent, like the dorsal, with two or three similar club-pointed spines; the caudal is of an uncommon form, being a little convex in the middle, with a short inverted horn at each end.

The *colour*. The beautiful colours of this fish, though more permanent than those of the dolphin, yet fade too quickly for the painter to sketch accurately, and it is next to impossible to describe them in words.

The face greenish, the edges of the lips light blue, the throat and opercula have a faint reddish tint, the eye changeable blue, red, and white. The scales are greenish with yellow margins, but the back and posterior part of the tail are darkened by a purplish tint, while the sides towards the belly brighten and slide insensibly into a pale red; the breast is of a pale green. The lateral line is smooth and singularly ramous, consisting of a series of small obverted fusi-form roots, from which issue minute uniform branches. The edge and root of the dorsal fin are of a light blue, the membrane faint green and yellow; the pectoral fin a dark reddish; the ventral a yellowish red: the first ray in both blue; the anal faintly reddish, striped the whole length by three blue fillets; the sides of the caudal fin blue, the horns yellow, the membrane yellowish red, with cross, waving, blue, fillets.

The *length*, including the caudal fin, one foot eight inches.

REMARKS.

The fishermen asserted that this fish very rarely appeared, which I was inclined to believe, from its having been brought to me once only.

CXIX.

SAHNEE MOIA.

CXX.

SAHNEE MOIA.

No. CXX.

LABRUS *cauda-sub-rotundata; corpore ovali, picto, linea laterali infracta; dente curvo ex angulo oris exerto, utrinque.*

The LABRUS with a roundish tail; an oval, highly coloured body; the lateral line broken. A small curve tooth protruding from the corner of the mouth, on each side.

Called also by the Natives SAHNEE MOIA.

B. v. *D.* $\frac{11}{21}$. *P.* 14. *V.* 6. *A.* 13. *C.* 14.

THE *body* long-oval, compressed, squamous. Scales large, smooth, ciliate, imbricate.

The *head* small, sharp, compressed, without scales; the front depressed, the neck roughish. Mouth middle, small, straight. Jaws a little extractile, equal, set with teeth. Lips large, covering the teeth. Teeth large, a little curve, close in the upper jaw, but more distant from each other in the lower: in the upper, there is a remarkable crooked tooth, projecting in the manner of tusks from the corner of the mouth on each side. Tongue short, obtuse, smooth. Palate smooth, the throat rough; the eyes high, small, orbicular; the iris orange. Nostrils double, before the superior edge of the orbit.

The branchial opercula consist of two acuminate laminæ, without scales; the aperture lateral; the membrane covered.

The *trunk*. The back convex; sides compressed; belly rather plane. Branchiæ consist of three simple leaves. The lateral line bends gently from the edge of the opercula to the end of the dorsal fin, then declines rapidly, and is continued straight along the middle of the tail. The anus middle, depressed.

The *fins*. The dorsal solitary, lower in the middle than at either extremity, with a remarkable spot on the anterior part; the pectoral acuminate at top; the first ray of the ventral long and setaceous; the anal of the form of the hinder part of the dorsal; the caudal fin rounded at the edge.

The *colour*. The face sea-green with a few streaks of purple and dusky yellow. The back dark-green, the sides variegated with a few purple and orange fillets. The green of the trunk shades off to a dull white on the belly. The dorsal fin spotted green and purple, and there is a remarkable black spot with an orange dot, on the membrane between the fifth and seventh ray; the root of the pectoral red, the rest light; the ventral and anal fins with spots of a lighter green than the dorsal; the rays of the anal purplish, with some streaks of orange towards the tail; the caudal fin strewed with green spots with purple borders, the margin yellowish green.

Length, five inches.

PERCA.

GENERIC CHARACTER.

Caput: opercula squamosa, serrata.
Membrana branchiostega radiis septem.
Corpus: linea lateralis cum dorso arcuata; pinnæ spinosæ.

The head: the opercula squamous, serrated. The branchial membrane has seven ossicles.
The body: the lateral line arched like the back; the fins spinous.

No. CXXI.

PERCA *cauda bifida; corpore vittis flavis fuscisque; spina secunda anali permagna.*

The PERCH with a forked tail; the body striped with yellow and brown fillets; and the second anal spine very large.

Called by the Natives PAIKEELI.

B. vii. *D.* $\frac{12}{27}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{3}{13}$. *C.* 18.

THE *body* oblong, compressed, squamous; the scales somewhat square, rounded behind, imbricate, tenacious.

The *head* ovate, small, compressed, declivous, mostly squamous; rostrum naked. The mouth low, small, horizontal; lips thickish. Jaws short, extractile, the upper longest. Teeth numerous in both jaws. Tongue somewhat round, smooth, not tied; palate tuberculate in the fore part. Eyes high, large, orbicular, iris of a yellowish white. Nostrils large, oval, near the orbit.

The opercula squamous, the first lamina serrated. The branchial aperture large, arched, the membrane exposed.

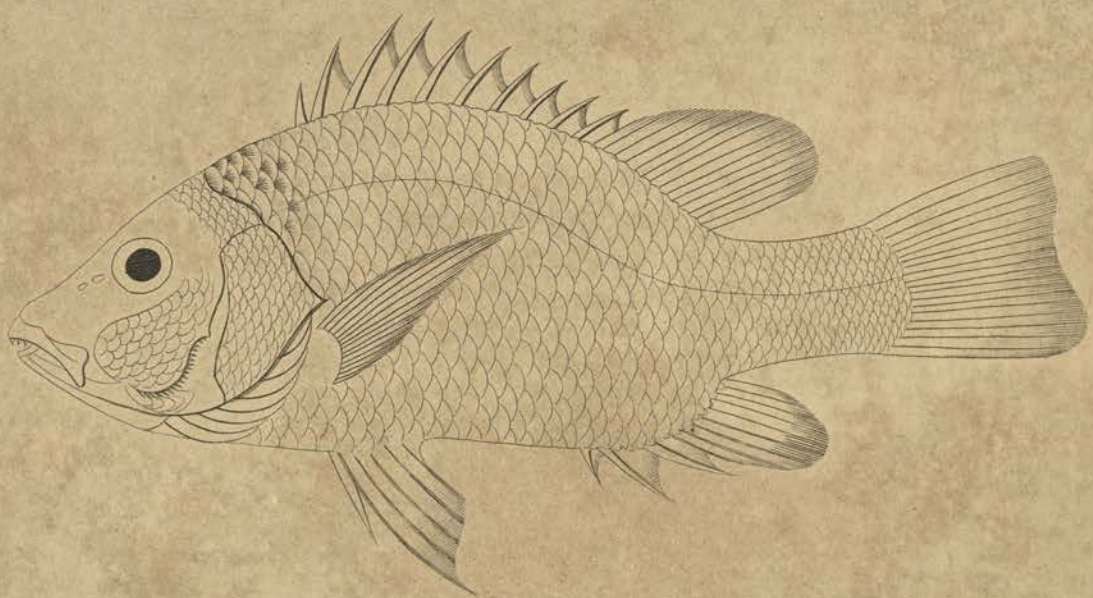
The *trunk*. The back rises in an arch, carinate; the sides compressed; the breast convex, but the belly nearly straight; the tail broad and long. The lateral line less arched than the back, becomes straight where the dorsal fin ends. The anus much nearer the head than the tail.

The *fins*. The dorsal spines, the first two excepted, long, and form a high arch; the ramous rays declining are much shorter; the pectoral long, slightly falcate; the end of the first ventral ray setaceous; the second anal spine remarkably large; the caudal not deeply bifid.

The *colour*. There are five or six longitudinal fillets, yellow, and dusky brown, on the sides; the breast and abdomen white; the pectoral and dorsal fins near the roots dotted with black.

The *length*, ten inches.

PAIKEELI



LINNEAN SOCIETY OF LONDON ROYAL

DOONDAWAH

No. CXXII.

PERCA *cauda sub-integra; spinis dorsalibus decem; pinnis pectoralibus caudalique rubescentibus.*

The PERCH with a tail nearly entire; ten dorsal spines; the pectoral and caudal fins of a pale red colour.

Called by the Natives DOONDAWAH.

B. vii. *D.* $\frac{10}{24}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 17.

THE head in this species is longer and sharper than in the last; the body less arched; the breast and belly flatter; the lateral line rises in a higher arch; and the scales on the trunk, besides being larger, are striate on the shoulder. In other characters they in general agree.

The *fins*. The dorsal spines are shorter than in the last, and the ramous rays are assurgent, forming a rounded point; the pectoral lanceolate and somewhat falcate; the spine of the ventral fin unusually large; the ramous rays of the ventral form a rounded point like the dorsal; the caudal emarginate, or a little shorter at the middle.

The *colour*. The upper part of the head a dark red, brightening on the cheeks and opercula to pink; the lips red. The back darker than the head, but gradually fades into a reddish white, which is the colour of the breast and abdomen. The dorsal fin a very light gray, with a purple margin, the white points of the spinous rays appearing above the margin. The pectoral are pink; the ventral and anal like the dorsal, but with a broader border of lighter purple; part of the tail pink, the lower lobe purple.

The *length* of the subject described, one foot four inches.

No. CXXIII.

PERCA *cauda oblonga, acuminata; spinis dorsalibus undecem; maculâ magna in pinna dorsali; corpore fasciis nigris, obliquis et transversis.*

The PERCH with an oblong tail, a little pointed; eleven dorsal spines; a large spot on the dorsal fin, and several oblique and cross black fillets on the body.

Called by the Natives SARI KULLA.

B. vii. *D.* $\frac{11}{34}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{2}{9}$. *C.* 17.

THE *body* ovate, compressed, covered with very small, firm, sub-orbicular scales. The head completely squamous, declivous, the rostrum short, obtuse, projecting a little over the mouth. Mouth low, horizontal, large; hardly any lips. Jaws extractile, the under shortest, both full of teeth. Teeth above distinct, regular, a little curve; below more crowded, in front tuberculous, and behind acerose. Tongue short, roundish, smooth, free. Palate without teeth. Eyes nearer the rostrum than the crown, large, orbicular. Nostrils double, in a groove near the orbit; the posterior (as usual) largest.

The opercula, branchial membrane, and aperture, as usual in this genus.

The *trunk*. The back carinate, the abdomen rather flat. The lateral line from the upper edge of the

opercula to the middle of the last portion of the dorsal fin, arched, then straight. The branchiæ and anus as usual.

The *fins*. The long dorsal fin interrupted, the anterior half arched, the posterior equal; the pectoral rather low, long, acuminate above; the ventral short, the second ray with a setaceous tail; the anal small, acuminate in the middle, and has only two spinous rays; the caudal oblong, entire, with a point.

Colour. The crown and back changeable pearl, the rest a silvery white; a large irregular black spot on the shoulder, a second much longer passes obliquely from the beginning of the dorsal fin to the lateral line, and then bends towards the abdomen, a third, narrower and shorter, crosses the line also; behind which are three more diminishing in size, the last on the upper part of the tail. On the dorsal fin, a broad, oblong, black macula extends from the second to the sixth spinous ray, the rest of the membrane stone-gray, with a narrow, black margin; the other fins are of a faint yellowish white.

Length, five inches.

No. CXXIV.

PERCA *cauda bifida; spinis dorsalibus duodecem macula parva in pinna dorsali, et maculis oblongis fuscis ad latera.*

The PERCH with a bifid tail, eleven dorsal spines; a small mark on the dorsal fin, and several oblong brown marks on the body.

Called by the Natives CARIPE.

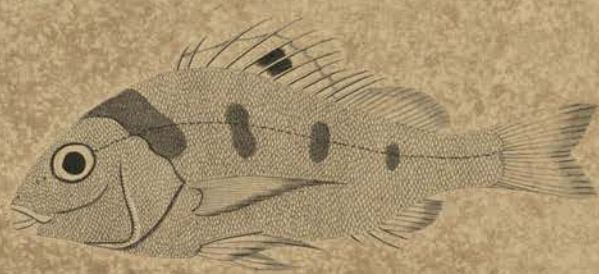
B. vii. *D.* $\frac{12}{25}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{3}{10}$. *C.* 18.

THIS in the material characters comes near the fish last described. It is rather thicker at the shoulders, the head less pointed, the crown broader, and the rostrum shorter. The eyes are higher, and the nostrils closer to each other and to the orbit. The teeth are smaller, setaceous; the lateral line less arched, and commences at the eye.

The ramous portion of the dorsal fin is shorter and more arched; the anal has three spinous rays; the caudal bifid.

It nearly resembles the former fish in colour. It has a fainter spot on the shoulder, but three only on the lateral line, in colour less dark; the black spot on the dorsal fin is small and square. The pectoral and ventral fins are of a faint yellow; the colour of the others as in the former fish.

The *length*, four inches and a half.



CXXIV

CXXIII

KAROOI.

KEELPUTA

No. CXXV.

PERCA *cauda sub-lunata; spinis dorsalibus undecem; corpore oblongo-ovale, vittis luteis, obliquis et longitudinalibus.*

The PERCH with a tail slightly lunate; an oblong-oval body, with oblique and longitudinal yellow fillets.

Called by the Natives KAROOI.

B. viii. *D.* $\frac{11}{23}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 19.

THE *body* oblong-oval: the scales larger than in the last.

The *head* less declivous and squamous. In the mouth, lips, jaws, tongue, and nostrils, no material difference is found; but the teeth are larger, more regular, and there are teeth in the palate; the eyes are much larger.

The opercula serrate; the lateral line, and position of the anus, nearly alike in both.

The *fins* resemble those of the last fish, in their situation and shape, only that the caudal, instead of bifid, is somewhat lunate.

The *colour.* The crown darkish red, the lips and opercula faint pink, the back dark, with an obscure mixture of yellow. Between the ridge of the back and lateral line, there are oblique bands of dark yellow, then two fillets of brighter yellow, and still lower are four or five fillets of more obscure yellow. The belly white. Dorsal, anal, and caudal fins yellow; ventral yellow, intermixed with white. Pectoral fin faint pink.

Length of the subject, seven inches.

No. CXXVI.

PERCA *cauda sub-lunata; corpore oblongo-ovale, vittis tribus fulvis ad latera; macula nigra semicirculari in pinna dorsali; aculeis tribus ad operculum, et lamina serrata prope pinnam pectoralem.*

The PERCH with a sub-lunate tail; an oblong-oval body, with three yellow fillets on the sides; a semicircular black spot on the dorsal fin; three small spiculi on the edge of the operculum, and a serrated lamina near the pectoral fin.

Called by the Natives KEELPUTA.

B. vi. *D.* $\frac{11}{21}$. *P.* 13. *V.* $\frac{1}{6}$. *A.* $\frac{3}{11}$. *C.* 18.

THE *body* oblong-oval, compressed, squamous, scales small, somewhat square, but rounded at the posterior side, imbricate, tenacious.

The *head* proportional, ovate, compressed, squamous; front slightly declivous, naked, depressed. The mouth wide, horizontal; lips thickish. Jaws extractile, short, nearly equal. The teeth numerous in each jaw, but most in the upper; in the under more sparse, but in front a few are longer and crooked. Tongue roundish, smooth, free. Palate tuberculate, in the fore part. Eyes high, large, somewhat oval; iris yellowish-white. Nostrils double, in a shallow groove, one near the orbit, the other smaller, near the point of the rostrum. The

branchiæ four-leaved; the exterior pectinate, the others tuberculate. The opercula squamous; the anterior lamina serrated, and armed with three short straight spines; the posterior terminates in a spinous point; between which and the pectoral fin there is a semicircular squama, or ossicle, serrated on the edge. The branchial membrane exposed; the aperture large, arched.

The *trunk*. The back gently arched, carinate, sides compressed, a little convex; the abdomen and throat gently rounded, the former a little flattened. The lateral line forms a low arch above the pectoral fin, then slopes gently to the middle of the tail. Anus nearer the tail than the head.

The *fins*. The dorsal solitary, composite; the two first spinous rays very short; from the third to the tenth they gradually shorten, but the tenth and eleventh, lying on the ramous portion, again lengthen: the ramous rays decline gently; the pectoral low, short, acuminate at top; the ventral longer than the pectoral, the second ray longest; the anal has three stout, spinous, assurgent rays; the ramous rays are likewise assurgent, and decline very little from the fifth. The caudal fin bifid.

The *colour*. The upper part of the head a darkish green, the rest white; the back also green, but changeable; the rest of the trunk a very light gray, terminating in white on the belly. On the sides are three fillets of a dusky yellowish-green, the lowest from the eye continued along the tail: still lower is a yellowish fillet ending with the anal fin.

The first part of the dorsal fin whitish, with a large semicircular black spot, the posterior part of the fin yellowish, with two fillets like continuations of those on the body. The pectoral, ventral, and anal fins yellowish-white; the caudal yellowish, with two oblique streaks, besides the fillet.

The *length* of the subject described, eight inches. It was caught at a little distance from the shore, but beyond the surf; they are sometimes caught of eleven or twelve inches. Their usual length in the river, where they swarm, is rarely more than five or six inches.

No. CXXVII.

PERCA *cauda rotundata; spinis dorsalibus undecem; corpore oblongo, maculis fuscis; aculeis tribus planis in operculo posteriore.*

The PERCH with a round tail; and eleven spines in the dorsal fin; an oblong body spotted with yellowish spots; three flat spines in the hinder operculum.

Called by the Natives BONTOO.

B. vii. *D.* $\frac{11}{28}$. *P.* 18. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 17.

THE *body* oblong, compressed, but thick and roundish. Scales small, close, tenacious.

The *head* large, thick, compressed, nearly as broad as the trunk, the vertex a little depressed, the rostrum short, declivous. The mouth horizontal, wide; the lips thickish. Jaws extractile, the lower a little longer than the upper. Teeth numerous, in several rows, the exterior larger than the interior, reflex: two longer teeth in front of each jaw. Tongue narrow, rounded, smooth, free. Palate wide, denticulate. Eyes, supreme, round, near the rostrum. Nostrils double, round, near the orbit.

The anterior lamina of the opercula serrate, the posterior acuminate, and armed with three stout, flat, straight, spines. The branchial membrane half exposed when the mouth is shut. The aperture large.

The *trunk*. The back and belly slightly convex; the sides and tail compressed, but roundish. The lateral line very small, high, descends from the point of the opercula, bending a very little over the pectoral fin, and terminates at the middle of the caudal fin. Anus nearly middle.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

The *fins*. The dorsal single, composite, the spines (the two first excepted) nearly of equal length; the ramous rays to the ninth assurgent, when the remaining four declining give a rounded form to the fin. The pectoral and caudal fins orbicular; the ventral long, ramous, with one stout spine; the anal, in shape exactly like the opposite dorsal, with three spines.

The *colour* cineritious, spotted with dusky yellow, or brown, round spots; the colour on the belly is lighter; the spots on the fins smaller and darker.

The *length* one foot eight inches.

REMARKS.

This fish is often brought to table in the winter, and when from one foot to one and a half in length, is reckoned delicate; but when larger, it becomes coarse. It grows to an enormous size. In the beginning of January 1786, one was brought to the Chief's house, measuring from the nose to the point of the caudal fin, seven feet, and in circumference, near the gills, five feet. It weighed three hundred and odd pounds.

About an inch of the anterior part of each jaw was without teeth; the rest full of short, strong, teeth.

The colour, so far as I could judge by candle light, was browner and the spots more obscure, than in the small fish; and the teeth of the serrated opercula were hardly discernible. The three spines very stout and large.

The Dutch name Jacob Evertsen has certainly been applied to several spotted Indian fishes. Ruysch gives no less than eleven figures, none of which agree with the present subject.

In Seba,* a figure under that name is found; and another in Bloch,† under the name Bodianus Guttatus. In both the spines on the opercula are clearly depicted, as well as the rounded tail; and Gronovius in his description concurs with them, though in other respects‡ differing from both.

In the Perca Guttata of Linneus reference is made to Marcgrave,§ Sloan,‖ and Catesby;¶ but in the figures given by these authors there are no spines in the opercula, and in all the caudal fin is entire, or square. The same remark is applicable to the several figures found in Valentine** and Renard.††

The present fish therefore is not the Perca Guttata of Linneus, the Gugupuguacu of the Brasils, the Jacob Evertsen of the Dutch and of Willoughby, nor does it agree to any of the figures in Valentine or Renard, though so common in India.

The Perka Tauvina of Forskal‡‡ approaches very near to the present fish and the one that follows.

Marcgrave's description of the Gugupuguacu, the shape of the tail excepted, agreed so nearly to that of the present Bontu, that on meeting with a subject of the enormous size mentioned above, I was inclined to think it the Gugupuguacu.

The Bodianus Guttatus depicted by Bloch was received from Tranquebar under the native name Ganimin, and on showing my drawing to the fishermen at Madras, the name they gave it, sounded to my ear Panamin; so that I have no doubt of their being the same fish: but the name received from the Missionary at Tranquebar, who understood the language, is more likely to be correct than what I wrote down by ear only, at Madras.

* Tab. 27. † Pl. 224. ‡ S. N. p. 485. § Brasil. p. 169. ‖ Sloan. Jamaic. T. 2. tab. 247.
¶ Carolin. tab. 14. ** No. 37. 41. †† No. 17. 111. 207. Tom. ii. No. 36. 300. ‡‡ No. 38.

No. CXXVIII.

PERCA *cauda rotundata; spinis dorsalibus undecem; corpore oblongo, maculis sub-nigris, spinæ planæ tres in operculo posteriore.*

The PERCH with a round tail; eleven dorsal spines; an oblong body, spotted with blackish round spots; three flat spines in the posterior operculum.

Called by the Natives MADINAWA BONTOO.

B. vii. *D.* $\frac{11}{27}$. *P.* 18. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 17.

THIS fish differing very little except in colour, from the one last described, may perhaps be merely a variety. It is much rarer than the other, and the fishermen asserted that it was never met with of a large size.

The *colour* is much darker; the spots more unequal in size, more irregularly scattered, and either nearly black or of a very dark brown. The iris is of an emerald colour.

The *length*, thirteen inches.

No. CXXIX.

PERCA *cauda rotundata; spinis dorsalibus novem; corpore oblongo, vittato; aculeis tribus ad marginem operculi posterioris.*

The PERCH with a rounded tail, and nine dorsal spines; an oblong body with longitudinal, coloured, stripes; three spines on the margin of the hinder operculum.

Called by the Natives RAHTEE BONTOO.

B. vii. *D.* $\frac{9}{26}$. *P.* 16. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 18.

THIS fish is more of the Perch form than the two preceding; the back is more convex, and the body shorter, and not assurgent towards the tail.

The first lamina of the operculum is not serrate; the spines on the second are on its edge, not on the middle, and much shorter than in the last; the fins are rather more orbicular; the dorsal spines nine only.

The *colour* extremely brilliant when fresh caught, but soon fades after death; and the fish, though put immediately into a pail of sea-water, survived but a very short time. The nose of a pale blue; the lips and throat spotted with a deeper blue, and fillets of the same colour diverging from the orbit, cross the yellow opercula and branchial membranes. The back and sides are variegated with azure, and dark yellow, fillets, alternately. The membrane of the dorsal spines pale blue edged yellow: all the other fins azure, striped with dusky yellow.

The *length*, including the caudal fin, nine inches.

MADINAWA BONTOO

RAHTEE BONTOO

STEGALAHTOO BONTOO

PANDOOMENDO

No. CXXX.

PERCA *cauda rotundata; spinis dorsalibus undecem; corpore oblongo-ovale, fasciis latis flavis; aculeis duobus in medio operculi posterioris.*

The PERCH with a rounded tail; eleven dorsal spines; an oblong-oval body, with broad yellow bands; two spines in the middle of the hinder operculum.

Called by the Natives SUGGALAHTOO BONTOO.

B. vii. *D.* $\frac{11}{25}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{3}{11}$. *C.* 18.

THIS fish agreeing in some respects with the three last described, differs in several others, besides shape and colour.

The *body* is oblong-oval, more slender and compressed; the head narrower towards the rostrum; the first lamina of the opercula distinctly pectinate; the second has two spines, not on the margin, but on the middle, as in No. CXXVII.; the lateral line higher, and more the shape of the back; the dorsal and anal fins less rounded.

The *colour.* The head and trunk very dark, nearly black; the lips spotted black and yellow; some yellow spots on the face; the anterior lamina of the operculum yellow. A dusky yellow, oblong spot on the shoulder, and a broad, irregular, band of lighter yellow, crosses the middle of the trunk; between which and the caudal fin are two more yellow bands. Part of the dorsal and anal fins dusky, the rest yellow, with unequal, round, black spots.

The *length*, eleven inches.

No. CXXXI.

PERCA *cauda rotundata; dorso dipterygio; rostro acuto sursum flexo; operculis aculeatis.*

The PERCH with a rounded tail; two dorsal fins; a sharp, turned up rostrum; and spines in the opercula.

Called by the Natives PANDOOMENOO.

B. vii. *D.* $\frac{7}{7}$—$\frac{1}{14}$. *P.* 15. *V.* $\frac{1}{6}$. *A.* $\frac{3}{12}$. *C.* 18.

THE *body* oblong, roundish, compressed; scales large, somewhat square, with a round, ciliate margin, loose.

The *head* small, compressed, pointed, squamous; rostrum short, turning upward. The mouth very oblique, large, wide; lips thickish. Jaws nearly of equal length, without long teeth, but both rough like a file. The tongue thin, hard, obtuse, free. The palate rough, like the jaws. Eyes supreme, near the rostrum, oval, moderate size. Nostrils double, nearer the orbit than the point of the rostrum, oval, the posterior, (as usual) largest.

The opercula squamous, the anterior lamina serrate, and the lower angle armed with three spines; the posterior acuminate, and has a shorter spine than the upper part. Besides these arms, there is a remarkable curve, serrated line, between the orbit and angle of the mouth, a small serrated lamina at the beginning of the lateral line, and another larger above the pectoral fin.

The branchial membrane is half exposed; the aperture large.

The *trunk*, till near the end of the dorsal fin, diminishes little in breadth, the back and belly convex, the sides compressed, convex; tail broad. The lateral line, from the upper edge of the opercula, descends obliquely to within two inches and a half of the caudal fin, where it becomes straight and middle. Anus remote, small.

The *fins*. Two distinct dorsal: in the first, two short and five stout declining spines; in the second, one spinous and thirteen soft assurgent rays; the pectoral low, short, acuminate at top, remarkably thin; ventral longer, thicker, with one strong spine; the anal rounded like the second dorsal, has three spines; the caudal fin orbicular.

The *colour* of the head and back a darkish gray, growing lighter towards the belly, which with the breast and part of the face are pearl. The pectoral fin is of a faint, the ventral of a deep, yellow; the other fins are darker than the back.

The *length*, one foot and a half.

REMARKS.

This fish grows to three feet and a half in length, but is best when of the size described, or about two feet long. It is reckoned one of the best fish brought to table, more especially at Calcutta, where it is known under the name of Cockup; but is rather rare at Vizagapatam, and held inferior to other fish more common on the coast.

No. CXXXII.

PERCA *cauda sub-integra; spinis dorsalibus duodecem; capite acuto, toto squamoso; corpore cinereo, squamis ciliatis; spina anali secunda permagna.*

The PERCH with a tail hardly divided; twelve dorsal spines; the head sharp, entirely squamous; a cineritious body with ciliated scales; the second anal spine very big.

Called by the Natives GUORAKA.

B. vii. *D.* $\frac{12}{26}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{3}{11}$. *C.* 17.

THE *body* nearly of the form of the common Perch; the scales large and ciliate, and rise unusually high on the anal fin.

The *head* sharp, declivous, squamous; the mouth low, the teeth, tongue, palate, &c. as usual.

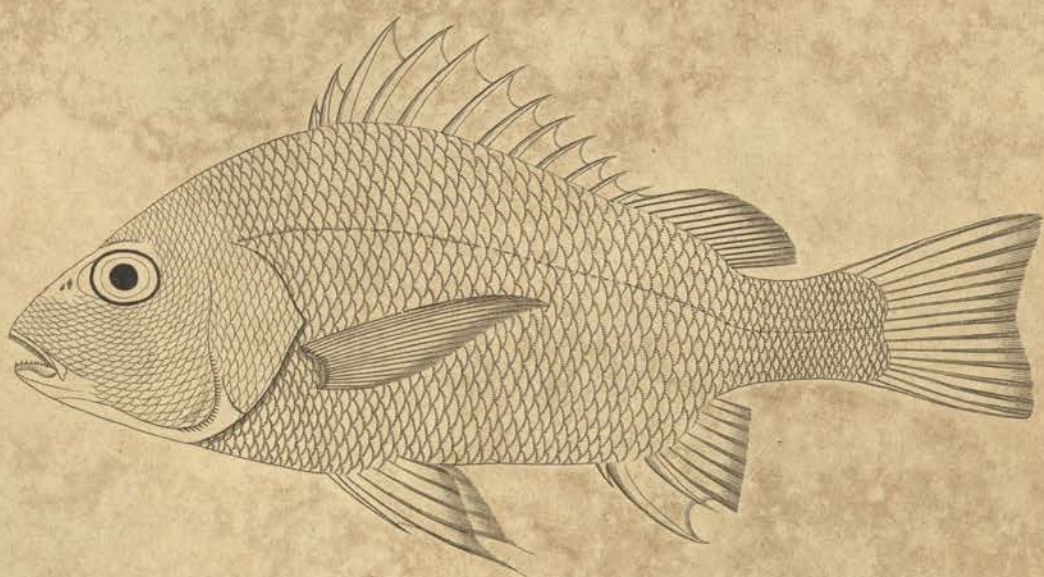
The *eyes* supreme, large; iris silvery. Nostrils high, close to each other, unequal, the posterior oval.

The lateral line arched to the end of the dorsal fin, then straight, and exactly middle.

The *fins*. The spinous portion of the dorsal fin, arched, the ramous short, slightly rounded; the pectoral long, acuminate at top; the second ray of the ventral setaceous. The ramous rays of the anal declining; the second spinous ray remarkably stout; the caudal broad, emarginate.

The *colour*. The head light, resplendent, reflecting various colours. The back light gray, growing paler towards the line, below which it is of a yellowish white. The dorsal fin a little dusky, with some small black spots on the membrane. The other fins have a cast of yellow.

The *length* of the subject described, two feet; but that of the specimen drawn only eight inches.



THE NEW YORK PUBLIC LIBRARY

GUORAKA

KODIPUNGI

No. CXXXIII.

GASTEROSTEUS *spinis dorsalibus tredecem; cauda oblonga cuspidata, utrinque aculeata; pinnis pectoralibus perlongis.*

The GASTEROSTEUS with thirteen dorsal spines; an oblong sword-pointed tail, with prickles on both edges; the pectoral fins extremely long.

Gasterosteus volitans Linn. S. N. p. 491.

Called by the Natives KODIPUNGI.

B. vii. *D.* $\frac{13}{25}$. *P.* 13 *V.* $\frac{2}{6}$. *A.* $\frac{3}{11}$. *C.* 13.

THE *body* oblong-ovate, compressed, broad at the shoulders, covered with very minute sub-orbicular scales, carinate, tenacious.

The *head* large, compressed, rugged, and armed with numerous prickles; the front declivous, depressed, or furrowed; several prickles near the point of the rostrum. Six small cirri only were found; one, on each side, from the upper jaw, and two from the edge of the opercula.

Mouth oblique, large, wide; lips simple. Jaws extractile, the upper emarginate, and longer than the under. Teeth numerous, small, acerose, close. Tongue short, oval-form, smooth, free. Palate wide, rough in the fore part. Eyes close to the vertex, middle size, remote from the rostrum, orbicular. The upper margin of the orbit prickly. Nostrils double, gaping, distant from each other, the anterior guarded with prickles.

The branchial opercula somewhat three-laminated, bony, scabrous, and the two anterior armed with many spines; the posterior lamina ends in a soft point, behind which are two black spots. The membrane covered, but visible; the aperture large.

The *trunk*. The back a little arched and somewhat carinate, the breast and belly convex, plane; sides and tail compressed. Lateral line supreme, a little carinate, at first arched, then descends obliquely, and terminates at the base of the caudal fin. Anus nearer the tail than the head.

The *fins*. The dorsal single, occupying the whole back, from the neck to within half an inch of the tail. The thirteen spinal rays very long, the longest ray two inches four lines; the first, one inch in length; the last, eight lines; all are connected by a tender membrane, which reaches little more than half an inch from the root, and is continued upon the spines, but breaks off upon handling: the posterior part of the fin is assurgent to a point. The pectoral low, very broad, acuminate at top, and extends to near the caudal fin; the ventral long, lanceolate; the anal remote, assurgent, and pointed, like the second dorsal; the caudal fin oblong, a little rounded, but acuminate at the point: above and beneath, on the edges, are three distinct prickles.

The *colour*. The general colour is red, the throat, breast, and branchial membrane excepted, which are pure white. The head pink, with streaks of deeper red. The trunk with transverse fillets, some pink, others of yellowish-red, edged with pale-blue. The fins red; the pectoral and ventral (sometimes the dorsal) with small black dots, on the rays and membrane, and white dots, resembling pearls, on the under side; the margin of the ventral fins black; the anal and caudal red, without spots.

The *length*, nine inches.

REMARKS.

The cirri, except when the fish is fresh from the water, may easily escape notice.

It is not frequently met with at Vizagapatam.

This fish has been classed under the different genera Perca, Cottus, and Scorpæna, and stands under the latter in Gmelin's edition of Linnæus, p. 1217.

SCOMBER.

GENERIC CHARACTER.

Caput compressum, læve. Membrana branchialis radiis septem. Corpus læve, linea laterali postice carinata. Pinnæ spuriæ sæpius versus caudam.

The head compressed, smooth. The branchial membrane has seven ossicles. The body smooth, the hinder part of the lateral line carinated. There are often spurious fins towards the tail.

No. CXXXIV.

SCOMBER *pinnulis octo, seu novem; cauda falcata; corpore lanceolato, alepidoto, maculis ovalibus; eminentia membranacea, longitudinalis, ad finem lineæ lateralis.*

The SCOMBER with eight, or nine, pinnulæ; the body lanceolate, without scales, and with oval spots; a longitudinal membranous protuberance at the end of the lateral line.

Called by the Natives WINGERAM.

By the English SEER-FISH.

$B.$ vii. $D.\frac{16}{16}$. 20. $P.$ 20. $V.$ 6. $A.$ 20. $C.$ 30.

THE *body* lanceolate, compressed, without scales, smooth.

The *head* small, ovate, sharp, smooth; the front very gently declivous, somewhat flattened. Mouth large, oblique, with hardly any lips. The jaws extractile, of equal length; teeth numerous, close, regular, conical, somewhat larger in the under than in the upper jaw. The tongue small, ovate, a little rough in the middle, scarcely moveable. The palate and fauces rough. The eyes middle, near the rostrum, large, orbicular; iris silvery and yellow. Nostrils double, distant from each other, the posterior close to the orbit. Branchial opercula large, rounded, smooth, hardly more than one lamina. The membrane of seven rays, covered; aperture arched.

WINGERAM.

KOTAM.

The *trunk*. The back, breast, and abdomen, somewhat convex, but carinate also; the sides convex, compressed. Branchiæ four-leaved, pectinate. The lateral line supreme, gently arched to the beginning of the pinnulæ, then straight to the middle of the caudal fin, carinate to near the end, where it has a fin-like edge. The anus middle.

The *fins*. There are two dorsal fins besides the pinnulæ: the first spinous, consisting of fifteen or sixteen soft spines, of which the last six, (connected by a very tender membrane and lying in a groove) may easily escape notice if not raised; the second has eighteen or twenty ramous, declining rays, the last three with somewhat the appearance of pinnulæ: the pinnæ spuriæ vary from eight to nine. The pectoral fins middle, broad, acuminate above; the ventral of the same shape but not half so long; the anal of the same form with the second dorsal; the pinnulæ vary from seven to eight; the caudal completely falcate, and all the fins are somewhat of a falcate form.

The *colour*. The upper part of the head a changeable dark green and blue, the ridge of the back of the same colour, but changes to a polished leaden, which, from the lateral line growing gradually lighter, terminates on the belly in a bluish white. Above, but parallel to the line, a row of small, round spots, nearly black; and on the sides are several similar spots. The fins are darkish, the ventral and anal excepted, which are of the same colour with the belly.

Length of the subject described, one foot five inches,

REMARKS.

This is one of the fishes esteemed by the Europeans. It is reckoned best when about the size of two feet. Under fourteen inches, is drier than an indifferent English Mackarel, but when it exceeds two feet and a half, is coarse and insipid.

The figure now presented, differs considerably from the figure of the same fish given by Bloch, particularly in the shape of the first dorsal fin and the tail. In the Appendix to Willoughby, (to which Bloch makes reference) the figure is without the first dorsal fin: owing probably to the drawing being made from a dried subject.

No. CXXXV.

SCOMBER *pinnulis dorsalibus decem, analibus duodecem; cauda falcata; corpore lanceolato, alepidoto, maculis oblongis; linea lateralis infracta, ad finem carinata, cum appendice membranacea.*

The SCOMBER with ten dorsal, and twelve anal pinnulæ: the tail falcate. The body lanceolate, naked, with oblong spots. The lateral line infracted, and carinate towards the end, with a membranous appendix.

Called by the Natives KONAM.

B. vii. *D.* $\frac{16}{16}$. 16. *P.* 22. *V.* 6. *A.* 14. *C.* 24.

THIS fish in the shape of the body and head, as likewise of the mouth, tongue, palate, and eyes, agrees nearly with the Seer-fish. The teeth here are not so close, and incline forward; the lateral line less conspicuous, more straight above the pectoral fin, and slopes more abruptly opposite to the dorsal; has no carina till near the end, where there is a membranous protuberance.

The *fins*. The first dorsal interrupted, being lowest in the middle, but the connecting membrane is much stronger, and at both extremities quite black; four of the dorsal pinnulæ and six of the anal are united by small threads with the respective fins, while the posterior pinnulæ are entirely distinct, as in the Seer-fish.

The *colour* much the same with the former, but the trunk more spotted, especially above the lateral line; the spots are oblong, transverse, and less dusky. The first dorsal is glossy in the middle, the rest black; the other fins a little lighter than the back.

Length, two feet eight inches.

REMARKS.

The Konam is a much rarer fish than the Wingeram, and inferior in quality, at least when of the above size. Though strongly resembling the Seer-fish, it is clearly a distinct species.

No. CXXXVI.

SCOMBER *pinnulis quinque, supra infraque; cauda bifurca; corpore oblongo-ovato, squamoso.*

The SCOMBER with five pinnulæ on the tail, above and below; a forked tail; the body oblong-ovate, and squamous.

Called by the Natives KANAGURTA.

B. vii. *D.* $\frac{9}{9}$. 12. *P.* 18. *V.* $\frac{1}{6}$. *A.* 19. *C.* 22.

THE *body* oblong-ovate, compressed, squamous. Scales very small, somewhat angular, imbricate, deciduous.

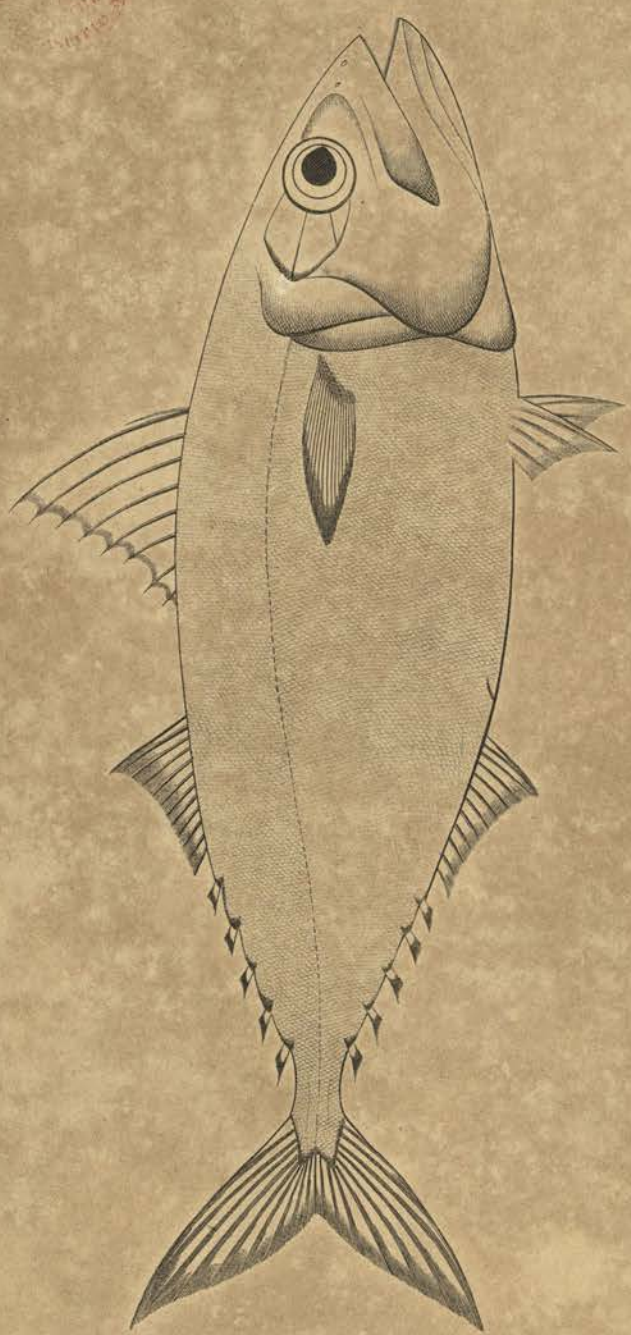
The *head* rather large, ovate, compressed, without scales; the front sloping, depressed, smooth. Mouth large, oblique; the teeth very small, straight, numerous; tongue small, roundish, smooth, free; palate smooth. Eyes supreme, large, orbicular. Nostrils double, distant. Branchial opercula smooth, the posterior lamina ciliate.

The *trunk*. The back and breast convex, carinate; the abdomen rather flat; the sides compressed; the end of the tail small and roundish. Branchiæ dissimilar, the exterior tuberculate. Lateral line high, bending very little. The anus nearer the tail than the head.

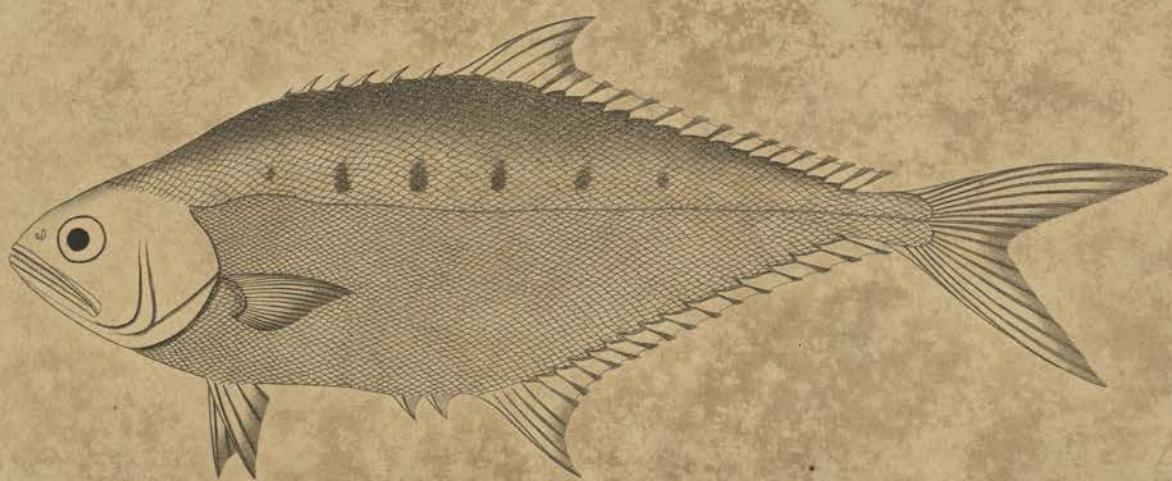
The *fins*. The first dorsal in a groove, with nine spinous declining rays; the second with twelve ramous rays; the pinnulæ distinct; the pectoral fins high, short, lanceolate; the ventral nearly of the same length as the pectoral, acuminate above; the anal exactly like the second dorsal; the caudal bifid.

The *colour*. The front a dark green; the face and opercula silvery; the back changeable green, blue, and golden, the sides and belly glossy, pearl-white; the dorsal and caudal fins have a yellowish cast, the others are light, glassy.

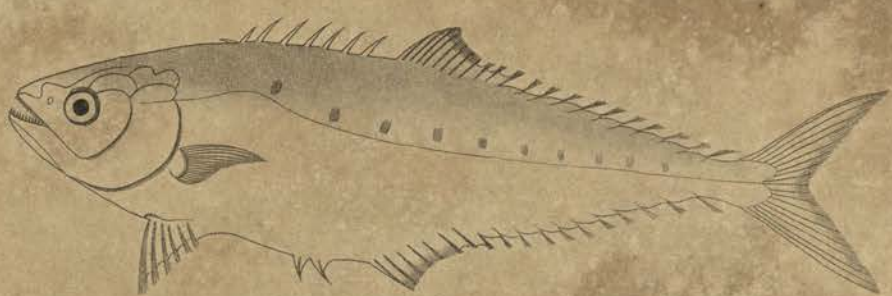
The *length*, ten inches.



KANAGURTA.



TOLOO PARAH



Tol. Parah

No. CXXXVII.

SCOMBER *pinnulis caudæ unitis, utrinque quindecem; cauda bifurca; corpore squamoso; maculis sex supra lineam lateralem, rectam, muticam; pinna biradiata ante pinnam ani.*

The SCOMBER with fifteen united pinnulæ on each edge of the tail; a forked tail; a squamous body, with six spots above the lateral line which is not carinated, and nearly straight; a small fin of two spines before the anal fin.

Called by the Natives TOLOO PARAH.

B. vii. *D.* $\frac{6}{6}$. 21. *P.* 18. *V.* 5. *A.* $\frac{2}{2}$. 20. *C.* 19.

THE *body* of this species is also squamous, and nearly of the same shape with the last, with which it agrees in several of the other characters. The nostrils are closer together, the teeth larger, the lateral line lower, and more straight, and the anus more distant from the tail.

The *fins*. The first dorsal fin is very different, consisting of six short, stout spines, in a groove, the second dorsal more falcate, than in the last, and the pinnulæ are united with the longer ramous rays; the anal fin is opposite, of the same form, and the pinnulæ in like manner united: but between the anus and that fin, there is a small one of two spinous rays. The other fins as in the last, only that the pectoral are situated much lower.

The *colour*. The upper part of the head dark blue, face and opercula white; iris pearl. The back a shade lighter than the head, and growing gradually more pale, terminates on the belly in a yellowish white.

Above the lateral line, are six small dusky spots in a row.

The dorsal, anal, and caudal fins are darkish, the pectoral and ventral glassy.

Length of the subject described, eighteen inches.

No. CXXXVIII.

SCOMBER *pinnulis dorsalibus unitis decem; cauda profunde bifida; corpore alepidoto, maculis decem; spina horizontalis antrorsum versa, ante spinas dorsales; pinna biradiata ante pinnam ani.*

The SCOMBER with ten united dorsal pinnulæ; a forked tail; a naked body, with ten spots; a horizontal spine pointing forward, in front of the dorsal spines; a fin consisting of two spines before the anal fin.

Called by the Natives TOL PARAH.

B. vii. *D.* $\frac{7}{7}$. 21. *P.* 17. *V.* 6. *A.* $\frac{2}{2}$. 19. *C.* 20.

THIS species is more of a lanceolate shape than the last, and without scales. The mouth, teeth, and tongue, agree with the last; but the opercula are rounder, and the row of spots above the lateral line, more numerous.

Before the first dorsal fin there is a small, recumbent, flattish, spine, pointing forward, and unconnected with the others, which have an opposite direction. The position and shape of the other fins are the same in both

fishes, but a small spine lying close on the first ray of the ramous, dorsal, and anal fins, is oftener in this found with the point separated, than in the former. The two-rayed anal fin, in both, is in a groove, like the first dorsal. The pinnulæ are connected, as in the former.

The *colour*. The upper part of the head green, the rest white, the back a deep blue, fading into white; the spots dusky, with an obscure bluish cast. The fins glassy, the pectoral and ventral a little yellow.

Length, seven inches.

No. CXXXIX.

SCOMBER *pinnula solitaria prope pinnam caudalem, utrinque; cauda bifida; corpore squamoso, dorso dipterygio; linea laterali postice loricata.*

The SCOMBER with a single pinnula on each edge of the bifid tail; the body squamous; two dorsal fins; the hinder portion of the lateral line loricated.

Called by the Natives KURRA WODAGAWAH.

B. vi. *D.* $\frac{8}{8}$. 31. *P.* 20. *V.* 6. *A.* $\frac{2}{2}$. 24. *C.* 20.

THE *body*, as in the last, lanceolate, but covered with very minute, smooth scales.

The *head* naked, and the mouth, jaws, eyes, and nostrils, as in the genus. The teeth acerose; the tongue ovate, smooth, free; the palate tuberculate; the throat rough; the opercula less orbicular than in the last species, or than usual in the genus. The branchial membrane has six rays only.

The *trunk*. The lateral line chiefly remarkable by being highly carinate, and the posterior part broad, bony, and prickly. The anus behind the middle.

The *fins*. The dorsal and anal fins differ from the preceding species. The first dorsal consists of eight slender, long, spinous rays; the second of thirty-one soft, simple rays, without any appearance of pinnulæ; the second anal has twenty-four similar rays; the other fins are ramous as usual, but the pectoral is longer and more pointed. On each edge of the tail, near the caudal fin, is a small distinct pinnula.

The general *colour* of the head and back a bright lead, softening downwards into white. The fins glassy, the caudal slightly yellow.

The *length*, between six and seven inches.

No. CXL.

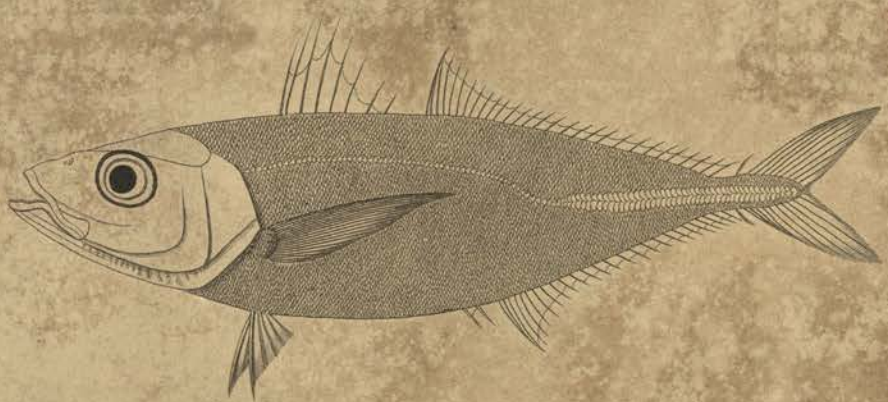
SCOMBER *pinnulis dorsalibus unilis sexdecem; cauda profunde bifida, sub-falcata; corpore alepidoto, supra lineam lateralem aspero, infra lævi; linea laterali infracta.*

The SCOMBER with sixteen united pinnulæ; a tail deeply divided and slightly falcate; a body without scales, rough above the line, smooth under it; the lateral line infracted.

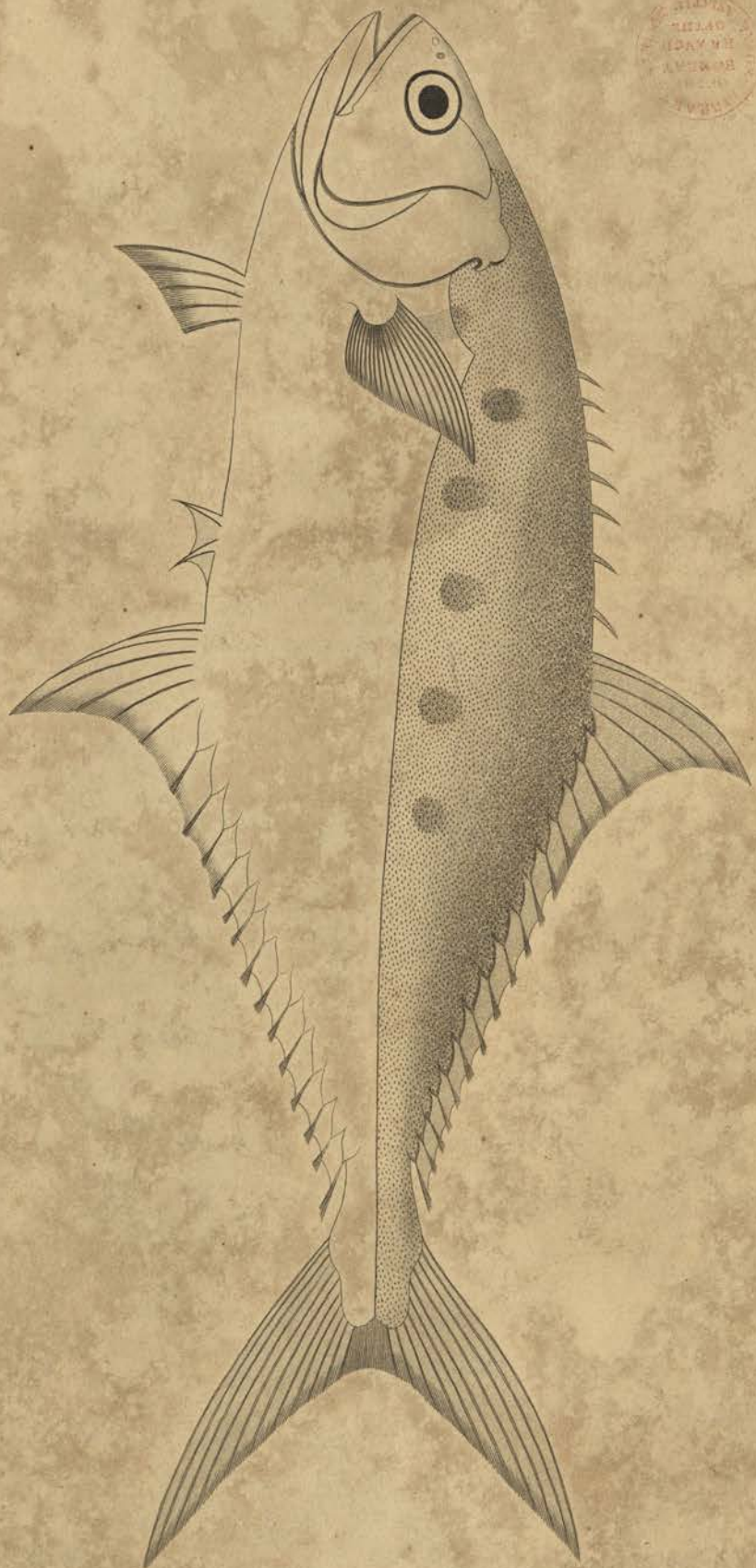
Called by the Natives TALA PARAH.

B. vii. *D.* $\frac{7}{7}$. 21. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 20. *C.* 20.

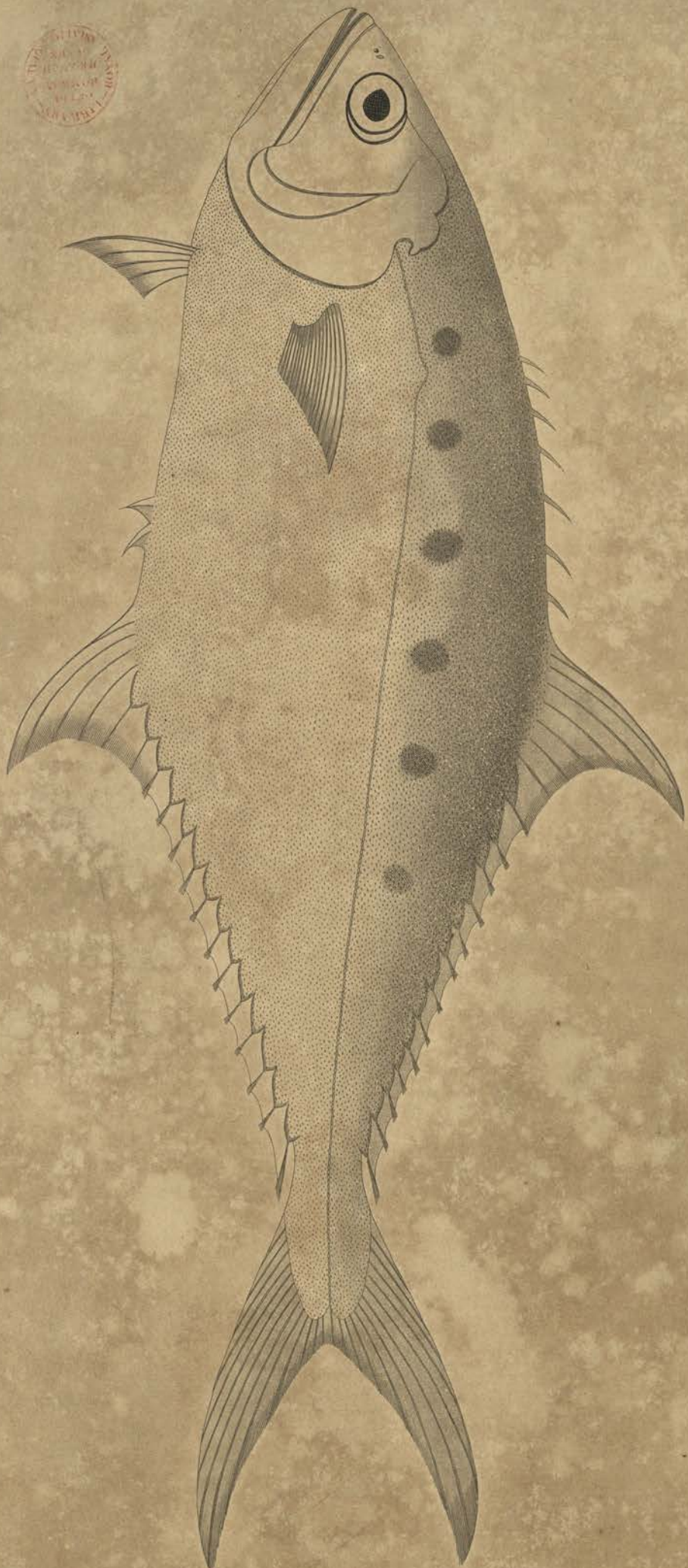
THE *body* oblong-ovate, compressed, without scales, the skin tenacious, and above the lateral line roughish, being covered with minute, raised, short fibres; below the line, it is smooth.



KURRA WODAGAHWAH



TALA PARAH.



AKEN PARAH

The *head* rather obtuse, the mouth and eyes as usual; teeth linear, numerous, equal. Tongue, short, ovate, long, free, rough; palate and throat rough. Opercula rounded.

The *trunk*. The back gently arched, carinate; the sides compressed, but convex; the breast carinate, the abdomen flattish. The lateral line beginning at the upper edge of the opercula, rises for about an inch, then sloping to the middle of the trunk, forms a small angle above the pectoral fin, after which, it is middle and straight to the end. The anus nearer to the head than the caudal fin.

The *fins*. The first dorsal, in a groove, consists of seven spines, which when raised point alternately to opposite sides; the second, of five ramous rays with sixteen pinnulæ, the first six connected by the common membrane, the others by a very slender one; but it is remarkable of these pinnulæ, that each at its root seems to spring from a pyramidal protuberance not found where the pinnulæ are quite distinct. The same remark belongs to the second anal fin, which consists of six rays and fourteen united pinnulæ; the pectoral and ventral fins very short; the caudal deeply divided, and slightly falcate.

The *colour*. The upper part of the head dark blue, the rest glossy white, but the edge of the opercula yellow. The upper part of the back still darker, but brightens towards the lateral line, above which is a row of five or six darkish spots; under the line, the colour completely yellow. The dorsal and caudal fins are a little lighter than the back; the edge of the latter is of a pale yellow; the pectoral yellow above, at the root black.

The *length*, two feet four inches.

No. CXLI.

SCOMBER *pinnulis dorsi tredecem unitis; cauda falcata; corpore alepidoto, toto sub-aspero; maculis sex rotundis ad lineam lateralem.*

The SCOMBER with thirteen united dorsal pinnulæ; the tail falcate; the body without scales, but all over somewhat roughish; six round spots on each side above the lateral line.

Called by the Natives AKEN PARAH.

B. vii. *D.* $\frac{7}{7}$. $\frac{1}{21}$. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. $\frac{1}{19}$. *C.* 24.

THIS species differs chiefly in the following circumstances from the one last described. The head sharper; the roughish skin extends over the whole trunk, below as well as above the lateral line; the lateral line carinate, and the tail more falcate.

The *colour*. The upper part of the head greenish, opercula pearl; the ridge of the back dark blue, fading into a yellowish white below the lateral line: six round spots above the line, less dusky than in the last fish. The dorsal and caudal fins darker blue than the back; the pectoral yellow; the ventral and anal fins whitish.

Length. The subject described measured sixteen inches, but they are sometimes brought double that size.

REMARKS.

Though the second dorsal and anal fins are marked with a spinous ray, it should be observed that the spine, lying close on the second ray, seldom pierces the skin, and in such case is often omitted by the painter. In the present instance I follow my original memoranda, which mark spines, though perhaps improperly.

No. CXLII.

SCOMBER *pinnulis unitis sexdecem, supra infraque; cauda profunde bifida, falcata; corpore squamis orbiculatis; radiis aliquot pinnæ dorsalis analisque longioribus, falcatis; spina antrorsum spectans ante pinnam dorsalem.*

The SCOMBER with sixteen pinnulæ, above and below; a deeply divided, falcate tail; the body covered with orbicular scales, some longer falcate rays in the dorsal and anal fin; a spine pointing forward in front of the dorsal fin.

Called by the Natives BOTLA PARAH.

B. viii. *D.* $\frac{6}{6}$. $\frac{1}{23}$. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. $\frac{1}{22}$. *C.* 24.

THE *body* oblong-ovate, compressed, covered with small orbicular scales, imbricate, tenacious.

The *head* small, obtuse, compressed, without scales; the front declivous, carinate; the rostrum very obtuse; the mouth low, small, a little oblique; the lips simple. The lower jaw much shorter than the upper; in the fore part of each is a cluster of small teeth, which to the finger feels like a file, the rest of the teeth very minute, irregular. The tongue roundish, smooth; the palate tuberculate.

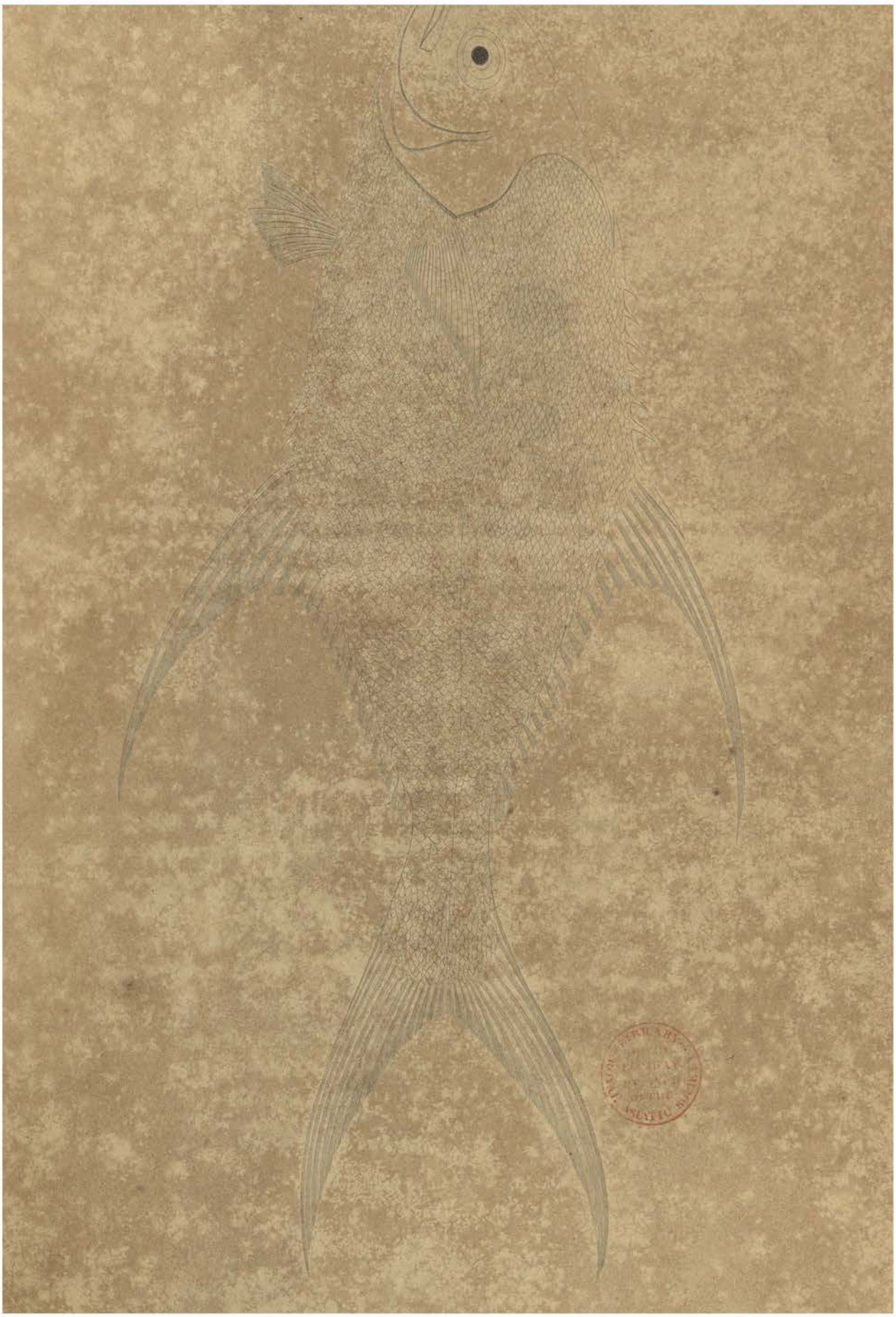
The eyes middle, large, orbicular; nostrils double, close, oval, the posterior by much the largest. The opercula rounded without scales. The branchial membrane with eight rays.

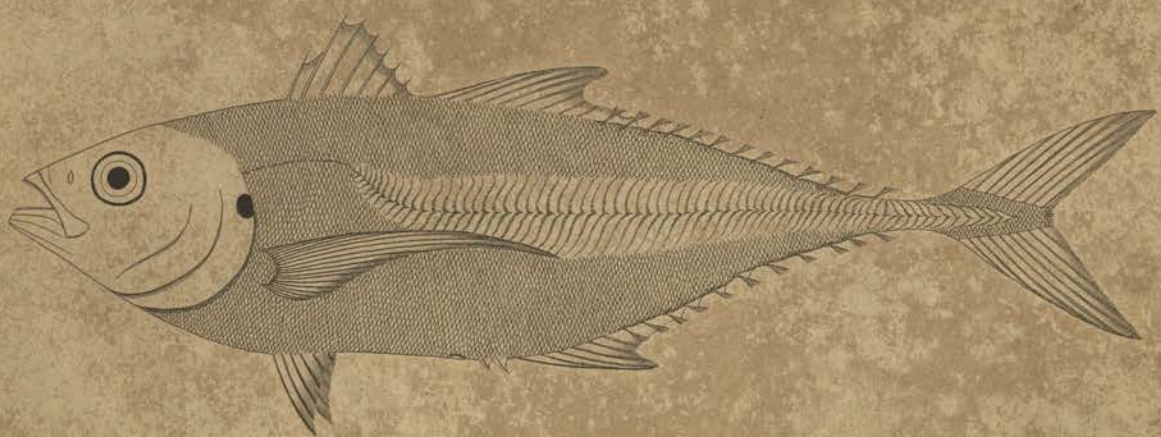
The *trunk*. The back and breast carinate; the lateral line nearly middle at its beginning, bends at first gently over the pectoral fin, and then runs straight to its termination. The anus middle.

The *fins*. Before the dorsal there is a recumbent spine pointing forward as in No. CXXXVIII. The first dorsal consists of six spines in a groove, diverging when raised; the second dorsal like the second anal, is distinguished by the extreme length of the first three ramous rays, forming a long falcate tail; the pinnulæ in both alike; a two-spine fin before the anal; the caudal more falcate than in the last, and the upper lobe longest.

The *colour*. The upper part of the head a dull leaden, the rest white. The back at first like the head, shades off to a light colour, with a tinge of yellow. The abdomen a yellowish white. Four large, dark leaden, oval spots, above the lateral line. The dorsal, anal, and caudal fins yellowish, but the interior falcate edges blackish. The pectoral yellow; the ventral light coloured.

Length, one foot seven inches.





WORAGOO

GUNDI PARAH

No. CXLIII.

SCOMBER *pinnulis dorsalibus tredecem, sex unitis, septem distinctis; cauda bifurca; corpore lanceolato, squamoso; linea laterali spinosa.*

The SCOMBER with thirteen dorsal pinnulæ, six united, and seven distinct; a lanceolate, squamous, body; and a prickly lateral line.

Called by the Natives WORAGOO.

B. vi. *D.* $\frac{7}{7}$. 14. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 12. *C.* 20.

THE *body* lanceolate, the scales very small. The head, mouth, tongue, and teeth, as described in the first species of this genus. The nostrils divided by a valve. The branchial membrane has six rays only. The back and breast, as usual, carinate; the abdomen rather flat; the tail near the fin remarkably small and round. The lateral line differs from all the preceding species: after forming a short smooth arch at its rise, it becomes straight and carinate, with uncommon prickly, oblique branches going off on each side. The anus middle.

The *fins*. The first dorsal consists of seven slender spinous rays, the first spine half the length of the second, the other five declining; the second fin has nine ramous rays united with six pinnulæ; behind which are six or seven distinct pinnulæ. The pectoral fin very long and falcate; the second anal, in shape like the dorsal, has six ramous rays, united with six pinnulæ; behind which are five distinct pinnulæ. The caudal fin bifid.

The *colour*. The upper part of the head and back, a dark green; a large spot of light yellow behind the orbit; a smaller of a beautiful changeable colour, on the upper edge of the last operculum; the rest of the fish pearl-white. The dorsal fins the colour of the back; the pinnulæ yellowish; the pectoral yellow; the ventral and anal light, glassy; the caudal yellowish, with a dusky margin.

Length, eleven inches.

No. CXLIV.

SCOMBER *pinnulis dorsalibus unitis undecem, seu duodecem; cauda profunde bifida, lobis lanceolatis; corpore lato-ovato, squamoso; spina recumbens horizontalis ante pinnam primam dorsi.*

The SCOMBER with eleven, or twelve, dorsal, united pinnulæ; a tail deeply bifid; the lobes lanceolate; the body broad-ovate, squamous; an horizontal couched spine before the first dorsal fin.

Called by the Natives GUNDI PARAH.

B. vii. *D.* $\frac{8}{8}$. 21. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 18. *C.* 22.

THE *body* broad-ovate, compressed, covered with small, orbicular scales, close, tenacious.

The *head* large, more declivous and less sharp than in any of the foregoing species; without scales, the first lamina of the opercula excepted; the front carinate, the rostrum obtuse. The mouth situated low, hardly oblique, large; lips thin; jaws extractile, nearly equal. The teeth in the under jaw and forepart of the upper, larger than usual in this genus, conical, a little curve: the rest small, but not acerose. The tongue ovate, scabrous, loose; the palate wide, roughish. The eyes middle, near the rostrum, large, round, not protuberant.

Nostrils near the orbit, the anterior largest, oval, the posterior rounded. The opercula rounded, the first laminæ squamous, the intermediate and last without scales. The branchial membrane seven-rayed, easily discovered; the aperture large, semicircular.

The *trunk*. The back more arched than the breast and abdomen; the sides compressed, the extremity of the tail roundish. The two exterior leaves of the branchiæ pectinate. The first half of the lateral line arched and carinate, the other broad, straight, loricated. The anus middle.

The *fins*. In front of the dorsal there is a recumbent spine, and two or three others seem to lie under the skin. The first dorsal fin consists of seven long, slender, spinous rays, in a groove; the second of eight or nine long, ramous rays, and eleven or twelve united pinnulæ: the second anal, which is of the same falcate shape, has six ramous rays and twelve pinnulæ. The pectoral fins very long, falcate; the ventral much shorter, acuminate above; the caudal deeply bifid, but not falcate.

The *colour*. The crown and face smooth, polished, green; throat and breast bright pearl. The upper part of the back darker green than the head, but changeable, and shading away to a very pale yellow; the belly white with a yellowish cast. The dorsal and upper lobe of the tail darkish; the pectoral, ventral, anal, and lower lobe of the caudal fin, yellow.

Length, one foot.

It is a dry, insipid fish.

No. CXLV.

SCOMBER *pinnulis dorsalibus unitis quindecem; cauda bifida; corpore squamoso; linea laterali carinata, postice loricata; pinnis pectoralibus perlongis, falcatis.*

The SCOMBER with fifteen united, dorsal pinnulæ; a bifid tail; a squamous body; a carinated lateral line, loricate on the part towards the end of the tail; the pectoral fins very long and falcate.

Called by the Natives KURUGOO PARAH.

B. vii. *D.* $\frac{8}{8}$. 22. *P.* 19. *V.* 6. *A.* $\frac{1}{2}$. 19. *C.* 24.

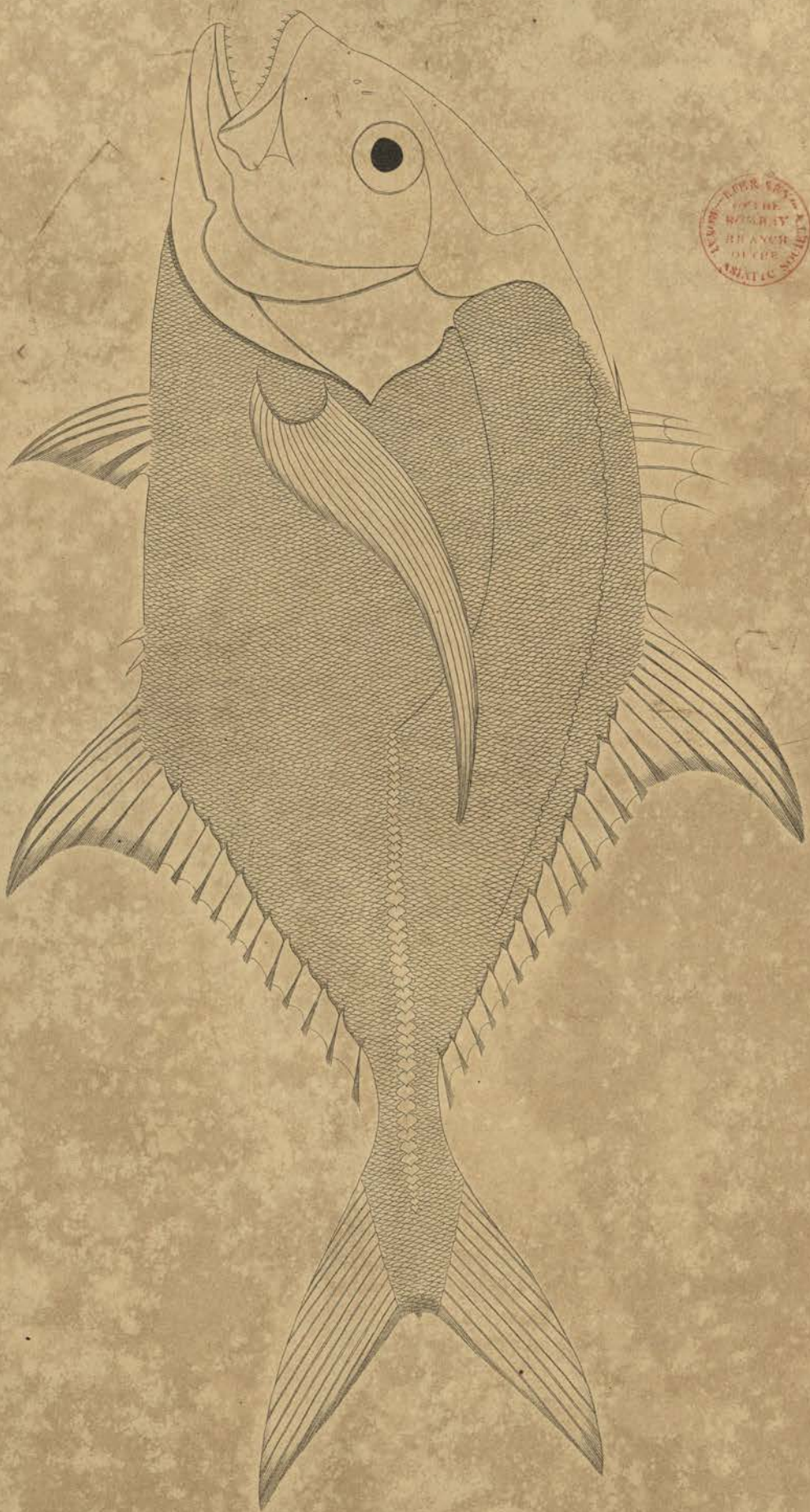
THIS species agrees in colour, as well as in most other characters, with the fish last described: it varies sufficiently in others to make it a distinct species.

The *body* broad, oblong, much arched above, almost straight below, the sides compressed, and the sides of the tail, from where the lateral line grows straight, form an angle; the head is larger, more declivous; the front a little depressed and divided by a ridge; the last lamina of the opercula acuminate with a soft point, and all are without scales.

The *fins* agree exactly in shape with the last; the spine before the dorsal fin is also found here, and sometimes spines concealed under the skin. The first dorsal has eight slender spines, besides one recumbent, which is unconnected; the pectoral remarkably long; the second dorsal and anal fins falcate, composed of ramous rays and united pinnulæ; the caudal bifid, with lanceolate lobes.

The *colour*. The crown green, the face lighter green; the throat and breast, pearl. The trunk and fins as described in the Gundi Parah.

Length, thirteen inches.



KURUGOO PARAH

R

Ecalah Parah

YARRADANREE PARAH

No. CXLVI.

SCOMBER *pinnulis dorsalibus unitis quatuordecem; cauda sub-falcata; operculo primo squamoso; aculeis sub cute ante pinnam primam dorsalem.*

The SCOMBER with fourteen united, dorsal pinnulæ; a tail somewhat falcate; the first operculum squamous; some spiculi covered by the skin in front of the first dorsal fin.

Called by the Natives ECALAH PARAH.

B. vii. *D.* $\frac{7}{7}$. 20. *P.* 20. *V.* 6. *A.* $\frac{2}{2}$. 17. *C.* 25.

THE shape of the body is exactly that of the last, from which it differs in the falcate form of the tail; and instead of the recumbent spine before the dorsal fin, there is an appearance of some latent spines under the skin. In the mouth, tongue, teeth, and eyes, there is no peculiarity.

The *colour*. The crown green, the face, opercula, and breast, pearl. The back changeable, green, blue, and purple, on a gold ground; sides, pearl; belly, yellowish-white; dorsal, and upper lobe of the caudal fin, an obscure green; pectoral, light, glassy; ventral, anal, and lower lobe of the caudal fin, yellow.

Length of the subject described, one foot; but they are brought much larger.

No. CXLVII.

SCOMBER *pinnulis unitis duodecem; cauda profunde bifida; corpore squamoso; linea laterali antice arcuata, undulata, postice loricata; pinnis flavescentibus.*

The SCOMBER with twelve united pinnulæ; a deeply bifid tail; a squamous body; the anterior part of the lateral line arched, undulate, the hinder part loricate; the fins yellowish.

Called by the Natives YARRADANREE PARAH.

B. vi. *D.* $\frac{7}{7}$. 20. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 17. *C.* 22.

THIS in its angular form behind, and straight abdomen, agrees with the two species immediately preceding. The branchial membrane has only six rays; the first part of the lateral line undulates; and there is no recumbent spine, nor vestige of latent spines on the back; the second dorsal and anal fins are composed of ramous rays and united pinnulæ; the caudal deeply bifid.

The *colour* silvery-brown, the back changeable green, and blue; all the fins yellowish; the tip of the upper lobe of the caudal, black.

The *length* usually ten inches; the breadth, where broadest, three and a quarter.

No. CXLVIII.

SCOMBER *pinnulis dorsalibus unitis quatuordecem; cauda falcata; spina distincta in pinna secunda dorsi, analisque.*

The SCOMBER with fourteen united, dorsal pinnulæ; a falcate tail; a distinct spine in the second dorsal, and second anal fin.

Called by the Natives WOTIM PARAH.

B. vii. *D.* $\frac{7}{7}$. $\frac{1}{22}$. *P.* 20. *V.* 6. *A.* $\frac{2}{2}$. $\frac{1}{18}$. *C.* 24.

THE *body* oblong, arched above and straight below, like the three last-described species; the head also is large, declivous, and without scales; but the mouth, though low, is more oblique, and the lips, thick. The tongue ovate, large, rough in the middle, the point sheathed. The eyes middle, large; the iris orange. Nostrils small, oval, contiguous. Opercula with membranous margins; a part only of the face, near the orbit, squamous. The first part of the lateral line arched, not undulating; and towards the end, highly loricated.

The *fins*. The spines of the first dorsal remarkably straggling, or distant from each other; the spinous ray of the second dorsal and second anal distinctly separate from the second rays: both fins are composed of ramous rays and united pinnulæ; the caudal falcate.

The *colour*. The upper part of the head and back, to near the pectoral fin, a changeable mixture of dark green, blue and gold; the belly white, skirted with yellow. Dorsal fin and upper lobe of the caudal, darkish. Pectoral and ventral, yellowish-white; the lower lobe of the caudal, brimstone, with a darkish edge.

The *length*, thirteen inches; the breadth, four and a half.

No. CXLIX.

SCOMBER *pinnulis analibus unitis duodecem; cauda sub-falcata, loborum apicibus nigris; corpore squamoso, fasciis transversis fuscis.*

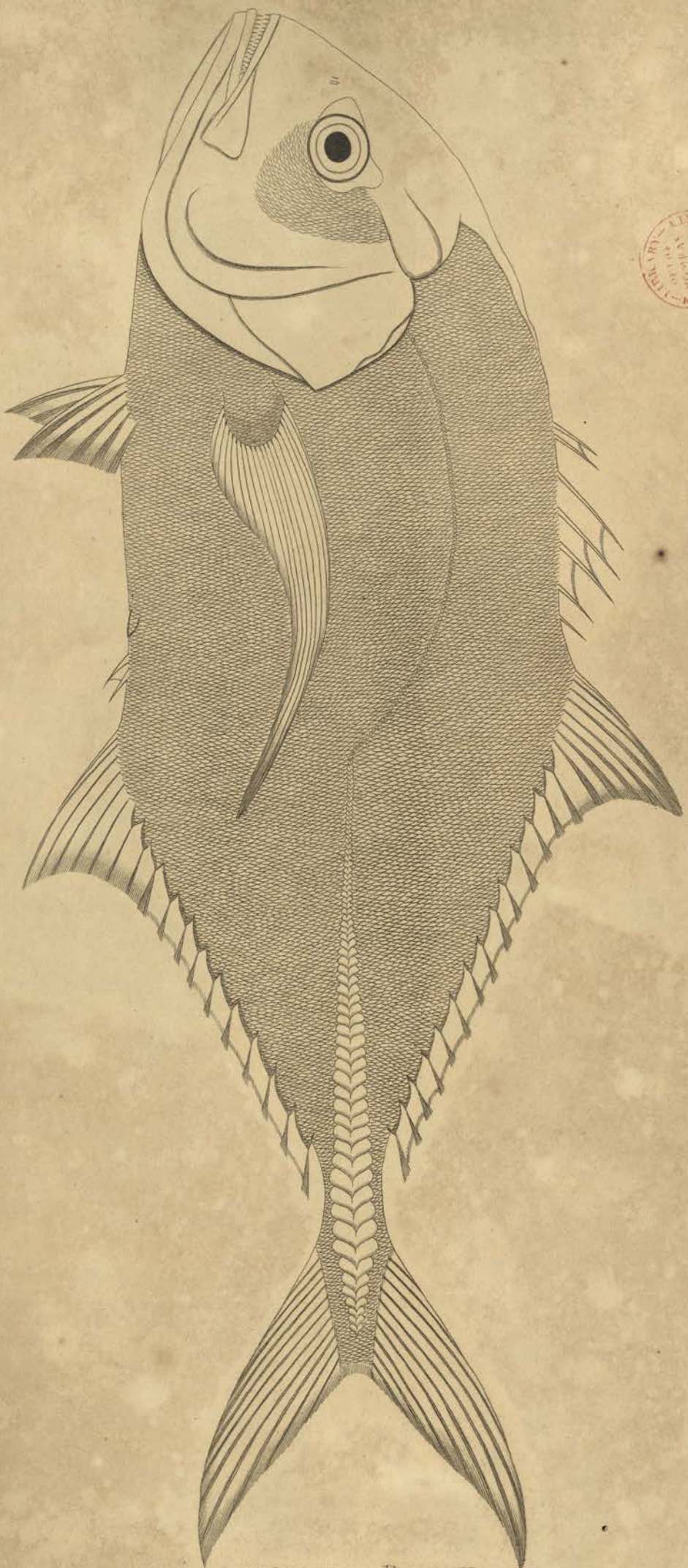
The SCOMBER with twelve united pinnulæ; a sub-falcate tail, with black pointed lobes; the body squamous, and cross brown bands on the sides.

Called by the Natives POLOOSOO PARAH.

B. vi. *D.* $\frac{7}{7}$. 20. *P.* 23. *V.* 6. *A.* $\frac{2}{2}$. 17. *C.* 20.

THIS species agreeing in the shape of the head and trunk nearly with those immediately preceding, differs little in other circumstances, except in colour. The breast is a little more rounded; the mouth, though low, somewhat oblique; the teeth are hardly perceivable; the opercula wholly squamous; and the branchial membrane has six ossicles only.

The *fins*. The dorsal spines very slender, and, as well as the first anal, in a groove; the second dorsal and anal narrow fins are slightly falcate, and united with the pinnulæ. The pectoral fins long and falcate; the ventral short, lanceolate; the caudal slightly falcate.



WOTIM PARAH

R

POLOOSOO PARAH

TALLAM PARAH

The general *colour*, except the breast and abdomen which are white, is yellow of different shades. From the upper edge of the orbit a curve streak of brown runs obliquely to the ridge of the back, and seven or eight fasciæ of the same colour cross the sides, broad and narrow alternately. All the fins are yellow; the lobes of the caudal tipped with black.

The *length* of the subject seven inches; the breadth, three inches one-third.

No. CL.

SCOMBER *pinnulis dorsalibus unitis undecem; cauda bifida; corpore lato-ovato, compresso, pectore alepidoto; linea laterali arcuata, carinata, postice recta, loricata.*

The SCOMBER with eleven united, dorsal pinnulæ; a bifid tail. The body broad-ovate, compressed, the breast naked; the lateral line arched and carinate, the hinder part straight and loricated.

Called by the Natives TALLAM PARAH.

B. vii. *D.* $\frac{7}{7}$. 22. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 18. *C.* 20.

THE *body* rather oval than ovate, compressed, and, except on the breast, covered with very minute scales.

The *head* declivous, compressed, without scales; the front and vertex carinate. The mouth low, a little oblique; lips simple. Teeth conical, close, regular. Tongue and palate smooth. Eyes supreme, very large, orbicular. The opercula without scales.

The *trunk*. The back and abdomen carinate; the sides thin, very much compressed. The branchiæ, lateral line, and anus, as in the fish last described.

The rays of the first dorsal fin slender, the three last very short; the second dorsal and second anal are composed of long rays and pinnulæ, but more strongly than usual connected, the membrane having a fibrous margin. The protuberance at the roots of the connected pinnulæ, were observed here, in some degree, at the base of the rays also. The first dorsal and first anal fin in grooves; the pectoral fin middle, falcate; the caudal bifid.

The *colour*. The upper part of the head and back have a faint greenish cast, on a silver ground; the rest silvery, faintly reflecting various colours, the throat and abdomen excepted which are simply white. The fins glossy with a yellowish cast.

The *length*, eight inches.

REMARKS.

This fish never appears at the English tables, but is salted by the natives, with other small fish, for the inland villages.

No. CLI.

SCOMBER *pinnulis dorsalibus unitis quindecem; cauda profunde bifida; corpore sub-orbiculato, pectore alepidoto; spinæ in dorso anteriore; pinnæ secundæ dorsalis radio primo elongato.*

The SCOMBER with fifteen united pinnulæ; a tail deeply divided; a roundish body, the breast without scales; spines in the fore part of the back; the first ray of the second dorsal fin elongated.

Called by the Natives TCHAWIL PARAH.

B. vii. *D.* $\frac{7}{7}$. 21. *P.* 18. *V.* 5. *A.* $\frac{2}{2}$. 17. *C.* 22.

THIS small species, for it seldom exceeds five inches in length, agrees in the general characters of the genus; but is distinguished by the length of the first ray of the second dorsal fin, which measured nearly two inches; the first dorsal consists of seven soft spines; there is a recumbent spine in front, and the appearance of several others under the skin, as in No. CXLIV. and CXLVI. The dorsal and anal fins in grooves; the second composed of rays and pinnulæ united. The pectoral long, falcate; the caudal bifid, the lobes lanceolate.

The *mouth* nearly middle; the lips and cheeks membranous, white, pellucid; the jaws extractile, but the upper capable of wider extension than the under, raising the rostrum along with it, which returns to its place when the mouth shuts. Teeth linear.

The *colour*. The crown, pale-green; the face and trunk, mother-of-pearl; the rest silvery white. The fins yellowish.

Length of the subject, five inches and a half.

No. CLII.

SCOMBER *pinnulis dorsalibus unitis quatuordecem; cauda bifida; pectore alepidoto, prominente; spinis ante pinnam dorsalem nullis; pinnula prima anali carens.*

The SCOMBER with fourteen united dorsal pinnulæ; a bifid tail; a prominent, naked, breast; no spines in front of the dorsal fin; and no first anal fin.

Called by the Natives MAIS PARAH.

B. vi. *D.* $\frac{5}{5}$. 24. *P.* 18. *V.* 5. *A.* 21. *C.* 21.

THIS agrees with the species last described in the structure and motion of the upper jaw, the membranous cheeks, the linear teeth, and the form of the dorsal, anal, and caudal fins; but it differs in other respects.

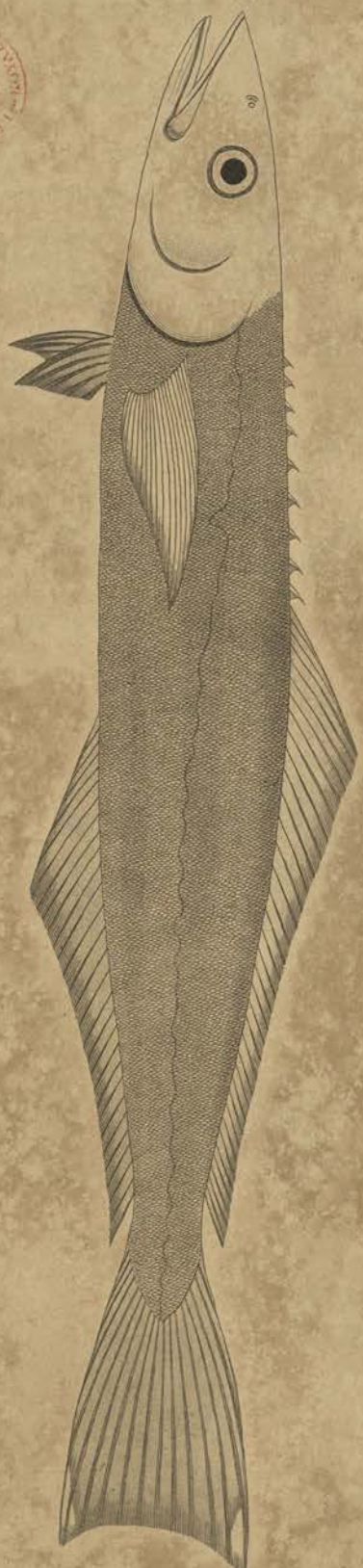
The *body* in the fore part, is broader, and rounder; the hind part, from the beginning of the second dorsal and anal fin, trigonal; the abdomen straight and flat; there is no recumbent dorsal spine; the biradiate anal fin is wanting; the first dorsal has only five spines; and the branchial membrane six rays. The pectoral fin in both is long and falcate; but the ventral are remarkably long and setaceous, with only five rays. In the opercula, smooth tongue, palate, and branchiæ, they agree. The lateral line undulates a little above the pectoral fin.

The *colour*, to the best of my recollection, was much the same as that of the species last described; but the only circumstance noted in my memoranda, is, that the iris was silvery.

TCHAWIL PARAH.

LIBRARY

MAIS PARAH



PEDDA MOTTAH

MODKALEE PARAH

No. CLIII.

SCOMBER *corpore longo-lanceolato, squamis exiguis, non imbricatis; linea laterali undulata; cauda lunulata.*

The SCOMBER with a long-lanceolate body; very small scales, contiguous, not imbricate; the lateral line undulating; a crescent-shape tail.

Called by the Natives PEDDA MOTTAH.

B. vii. *D.* $\frac{7}{7}$. 37. *P.* 18. *V.* 6. *A.* 26. *C.* 20.

THE *body* long-lanceolate, roundish, covered with very small orbicular scales, close together, not imbricate.

The *head* oblong, depressed, without scales; the front hardly slopes, naked; the rostrum rounded. The mouth long, nearly straight; lips thin; jaws extractile, the under somewhat shorter. Teeth very small, numerous, a little curve. Tongue large, oblong, obtuse, scabrous, free. The palate wide and rough. The eyes high, nearer the rostrum than the opercula, moderate size, round. Nostrils double, contiguous, the anterior largest, oval, the other round. The branchial opercula with two laminæ, semicircular, without scales; margin ciliate; the membrane covered, the aperture large.

The *trunk*. The upper and lower part almost straight, or sloping very gradually; the sides and abdomen convex. The exterior branchiæ pectinate, the others roughish, not tuberculate; the lateral line declines gradually, and undulates in a singular manner.

The *fins*. The first dorsal consists of nine short spines (sometimes seven) in a groove; the second of thirty-seven descending rays; the pectoral nearly middle, shorter than the head, broad, acuminate at top; the ventral short; the anal single, of the shape of the dorsal, but shorter; the caudal fin lunulate.

The *colour* of the head, trunk, and fins, almost black, except the throat, abdomen, and pectoral fins, which are cineritious. The caudal whitish at the points.

Length, one foot five inches.

No. CLIV.

SCOMBER *cauda falcata; rostro truncato; corpore sub-rhombeo, scabriusculo, alepidoto? linea laterali mutica; pinnis secundis dorsi anique falcatis.*

The SCOMBER with a falcate tail; a truncate rostrum; a rhomboid body, roughish, without scales? a smooth lateral line; the second dorsal and anal fin falcate.

Called by the Natives MOOKALEE PARAH.

B. vii. *D.* $\frac{6}{6}$. $\frac{1}{19}$. *P.* 19. *V.* 6. *A.* $\frac{2}{2}$. $\frac{1}{18}$. *C.* 22.

THE *body* somewhat of a rhomboid form, a little rough, but without apparent scales.

The *head* large, compressed, roundish, naked; front declivous, carinate; rostrum short, truncate. Mouth small, oblique, round, situated rather low; lips thick; jaws extractile, nearly equal, no teeth. Tongue large, ovate, smooth, tied. Palate broad, smooth. Eyes middle, very near the rostrum, moderate size, orbicular. Nostrils double, contiguous, the one next the orbit large, oval, the other small, round. The branchial opercula rounded, without scales, smooth; the membrane half exposed, the aperture wide, arched.

The *trunk*. The back, to the beginning of the second dorsal fin, arched and carinate, it then descends obliquely, the second dorsal occupying the declivity; the sides are a little convex, but compressed; the abdomen slanting, flat. The sides of the branchiæ somewhat rough, the exterior tuberculate. The lateral line (slightly carinate) forms a low arch over the pectoral fin, then runs straight along the middle of the tail. The anus nearest to the head.

The *fins*. The first dorsal consists of six short spines in a groove; the second of one short spine, and six long rays united with fourteen rays like pinnulæ, but without the usual protuberances at the root: the membrane unusually thick. The pectoral fins very short, broad, acuminate above; the ventral half the length of the pectoral; the first anal fin in a groove; the second has one short spine, and in other respects resembles the opposite dorsal, the long rays in both being falcate; the caudal completely falcate. Before the first dorsal fin there is a recumbent spine, as in several of the preceding species.

The *colour* of the head and trunk above the line, a dark leaden; the rest, including all the fins, excepting the dorsal and exterior part of the caudal lobes, yellow.

Length, eleven inches.

REMARKS.

In a subject of twenty inches, the colour of the head and back was of a bluish-gray, and the parts below the line, were white, instead of yellow. It is a dry insipid fish.

In the form of the dorsal and anal fins, the present fish resembles the Scomber Glaucus;* but in its general form it approaches nearer to the Chætodon Rhomboides.†

No. CLV.

SCOMBER *cauda bifida; corpore-ovali, alepidoto, cute striata; dorso dipterygio; macula magna in pinna prima dorsi.*

The SCOMBER with a bifid tail; an oval body, without scales, covered with a striated skin; two dorsal fins: in the first, a large spot.

Called by the Natives WORI PARAH.

B. vii. *D.* $\frac{7}{7}$. 24. *P.* 17. *A.* $\frac{2}{2}$. 21. *C.* 20.

THE body of this species is oval, thin, without scales; the skin singularly striated. The head small, compressed, sharp. The mouth a little oblique; lips thickish. Teeth very small, perceptible in the upper jaw to the touch only. The eyes, high, round. Nostrils contiguous, remote from the orbit. The opercula, &c. as usual in the Genus.

The *body*. The back, breast, and abdomen, carinate, the sides much compressed; the end of the tail small, roundish. The lateral line of the usual shape, carinate, and towards the end loricated. The anus middle.

The *fins*. The first dorsal declining from the third ray; the second fin declines from the fourth ray; the pectoral low, long, falcate; the ventral short, lanceolate; the first anal biradiate, as usual; the second exactly like the second dorsal; the caudal fin bifid.

The *colour*. The crown and back a deep blue, the rest mother-of-pearl; the belly white. The first dorsal fin pale-yellow at the bottom, the rest black; the other fins glassy, with more or less of a yellow tint.

Length, eight inches.

* Bloch, Pl. 209. † Id. Pl. 210.

WORRI PARAH

MITTA PARAH

R

No. CLVI.

SCOMBER *cauda sub-falcata; corpore ovato, non squamoso, cute striata; dorso monopterygio; linea laterali aspera, inversa curvata.*

The SCOMBER with a tail slightly falcate; an ovate body, without scales, covered with a striated skin; the lateral line bending towards the abdomen.

Called by the Natives MITTA PARAH.

B. vi. *D.* $\frac{7}{28}$. *P.* 18. *V.* 6. *A.* $\frac{2}{2}$. 16. *C.* 22.

THE *body* oblong-ovate, without scales, compressed; the skin has a striate appearance.

The *head* declivous, compressed, front carinate; mouth small; teeth linear. Tongue and palate smooth. Eyes middle, large; nostrils contiguous, in the middle between the orbit and rostrum. Opercula rounded, smooth. The branchial membrane has six rays.

The *trunk*. The back arched, carinate; the belly straight. The exterior branchiæ pectinate. The lateral line nearly middle, very slightly, and unusually, bent downward. The anus middle.

The *fins*. The dorsal single, the spinous and ramous rays being united; the latter, however, retain something of the united pinnular form. The pectoral middle, acuminate above; the ventral lanceolate, point setaceous; the second anal like the hinder part of the dorsal; the caudal when extended somewhat falcate.

The *colour* of the upper part of the head and back darkish, with an olive-green cast, the rest a bright leaden. The fins yellowish-white.

Length four inches, but sometimes twelve.

MULLUS.

GENERIC CHARACTER.

Caput compressum, declive, squamis tectum.	The head compressed, sloping, squamous.
Membrana branchiostega radiis tribus.	Three rays in the branchial membrane.
Corpus squamis magnis, facile deciduis.	The body covered with large scales, easily falling off.

No. CLVII.

MULLUS *cirris geminis sub mento; squamis magnis, ciliatis, deciduis; maculis duabus ovalibus supra lineam lateralem.*

The MULLUS with two cirri under the chin; large ciliated scales, adhering loosely; two oval spots above the lateral line.

Mullus barbatus Linn. S. N. p. 494.

Called by the Natives RAHTEE GOOLIVINDA.

B. iii. *D.* $\frac{8}{8}$. 9. *P.* 15. *V.* 6. *A.* 7. *C.* 18.

THE *body* oblong, compressed, but somewhat roundish; covered with large, orbicular scales, ciliate at the edge, obliquely notched at the base, deciduous.

The *head* large, declivous, compressed, somewhat angular; rostrum obtuse, without scales, polished. Mouth wide, lips thickish, loose. Jaws unequal; the upper arched, longer and broader, the under more extractile; both set with regular, marginal, almost straight, teeth. Tongue sub-triangular, obtuse, smooth, fixed. Eyes supreme, remote, orbicular, iris red. Nostrils very small, near the point of the rostrum, distant from the orbit. Opercula consist of three unequal plates, the posterior with a membranous margin, and a small spine above the pectoral fin. The branchial membrane covered; the aperture large.

The cirri rise externally from beneath the os hyoides, not from the lower jaw.

The *trunk*. The back gently curve, convex, the sides compressed; the breast and abdomen prominent, but sometimes flat. The branchiæ four-leaved, the exterior tuberculate and pectinate; the others tuberculate. The lateral line supreme, curves gently, almost parallel to the back. The anus small, nearly central.

The *fins*. First dorsal scapular, triangular, spinous; the second lumbar, gently declining. The pectoral nearly middle, acuminate at top; the ventral distant from each other, as long as the pectoral, lanceolate; the anal fin of the same form as the opposite dorsal, but narrower; the caudal bifid.

The *colours* extremely beautiful when the fish is alive, but quickly fade after death. The upper part of the head of a dark purple, with some lines of light violet; the cheeks pink, variegated with pale yellow, and waving light-blue lines; the lips reddish, with a dark spot at each corner of the mouth. The back a dark changeable purple; two oblong oval spots on the lateral line: the first golden and white, glows as if illuminated, but less permanent; the second nearer the tail, a very dark purple, forms a beautiful contrast. The sides are faintly

RAHTEE GOOLIVINDA

purple, with azure lines running above the pectoral fin to the tail; but lower towards the belly, they run on a changeable ground golden and white: the belly white, the throat white also, shaded with very faint pink.

The dorsal fins purple, streaked with light blue; the pectoral pink; the anal white and pink, with a few cross streaks of straw-yellow: the ossicles of the caudal reddish purple, the membrane dark green.

Length ten inches, and seldom exceeds fourteen.

REMARKS.

The red Mullet is rather a rare fish at Vizagapatam, and in quality inferior to the red Mullet of the Mediterranean, or of England.

No. CLVIII.

MULLUS *cirris duobus sub mento ; corpore squamis magnis sub-deciduis ; lineis luteis longitudinalibus duabus ; pinnæ dorsi caudæque lineis obliquis transversis.*

The MULLUS with two cirri under the chin ; the body covered with large loose scales ; two yellow fillets on the sides, and oblique, cross lines on the dorsal and caudal fins.

Mullus surmuletus Linn. S. N. p. 496.

Called by the Natives BANDI GOOLIVINDA.

B. iii. *D.* $\frac{8}{8}$. 9. *seu* $\frac{7}{7}$. 8. *P.* 16. *V.* 6. *A.* 7. *C.* 18.

THIS fish, except in colour, agrees in most circumstances with the former. The scales are less deciduous; and the nostrils nearer the orbit. The body white; with two yellow fillets from the gills to the tail on each side, the upper crossing the lateral line. The belly and breast a greenish white. The dorsal and caudal fins streaked obliquely with white and dusky yellow fillets; the ventral and anal of a greenish white.

The *length* seldom exceeds six inches.

This fish abounds in the river, but is in no estimation.

TRIGLA.

GENERIC CHARACTER.

Caput loricatum lineis scabris. Membrana branchiostega radiis vii. *Corpus cuneatum: digiti liberi ad pinnas pectorales.*

The head loricated with rough lines. Seven rays in the branchial membrane. The body wedge-form; free, articulated digiti at the pectoral fins. (between the pectoral and ventral fins.)

No. CLIX.

TRIGLA *digito libero solitario utrinque; corpore cunei-forme alepidoto; spina recurva ad rostrum; cauda truncata.*

The TRIGLA with a solitary digitus on each side; a wedge-form body, without scales; a recurve spine on the rostrum, and a truncate tail.

Called by the Natives WORRAH MINOO. A.

B. vi. *D.* $\frac{11}{22}$. *P.* 11. *V.* 6. *A.* 10. *C.* 10.

THE *body* wedge-form, a little compressed, very small near the caudal fin; no scales.

The *head* nearly as broad as the body, scabrous, and armed with many spines; the front declivous, grooved; a long curved spine on each side of the rostrum, two or three small prickles in front. Mouth large. Jaws extractile, nearly equal, the superior emarginate, and two small cirri pendent from the lower. Teeth small, acerose. Tongue short, smooth, obtuse, loose. Palate wide, tuberculate. The eyes close to the crown in a deep prickly orbit. Nostrils double, unequal in size, close on the point of the rostrum.

Branchial opercula rugged, and armed with small spines pointing backward; the membrane half exposed, the aperture large.

The *trunk*. The back and throat rather flat, the tail a little compressed. The branchiæ pectinate on the inside. Lateral line supreme, gently arched, and terminates at the upper edge of the tail. The anus remote.

The *fins*. The dorsal single, the eleven spinal rays nearly equal in height, the posterior part of the fin higher and rounded; the pectoral broad, half as long as the trunk, acuminate at top; the ventral broad, half the length of the pectoral; the anal equal, narrower than the opposite dorsal; the caudal truncate, and, as in all the others, the point of the rays extend beyond the membrane. The *digiti liberi* exactly under the pectoral fins.

The *colour* a dusky purple; the belly pink. The points of the dorsal spines and the margin of the membrane black, the posterior portion darkish purple. Pectoral and ventral fins reddish with a purple tint. The tail dark-purple, with two light coloured bands.

Length of the subject four inches.

B

A

COMMONWEALTH OF AUSTRALIA

BANDI GOOLIVINDA

WORRAH MINDO A

WORRAH MINDO B

R

MOOREE GODOO

No. CLX.

TRIGLA *digito uno, utrinque; cauda oblonga, acuminata; corpore squamoso, scabro; pinnis pectoralibus angustis, longitudine fere corporis; macula magna in pinna dorsali.*

The TRIGLA with a single digitus on each side; an oblong, pointed tail; the body squamous and rough; the pectoral fins narrow, nearly as long as the body; a large spot on the dorsal fin.

Called also by the Natives WORRAH MINOO. B.

B. vii. *D.* $\frac{15}{24}$. *P.* 10. *V.* $\frac{1}{6}$. *A.* $\frac{3}{10}$. *C.* 16.

THE *body* in shape nearly resembles the former, but is covered with carinate, rough scales.

The *head* less scabrous; the crown and front furrowed; spines in front and on the side of the rostrum, as in the former, besides prickles on the orbit and hind head. There are three cirri from the lower jaw. The mouth, jaws, tongue, and eyes, as in the former. The opercula striate, and armed with short spines. The lateral line supreme, nearly straight, terminating at the middle, not the upper edge, of the tail.

The *fins*. The dorsal spines rise higher, and being unequal form an arch, while the posterior portion of that fin is more oblong and rounded. The pectoral fins are much longer, forming narrow wings; the ventral proportionally longer than in the former, and each has one spine. The anal is rounded like the dorsal, and has three spinous rays; the caudal oblong, pointed. The rays of all, as in the former, exceed the membrane.

The *colour* reddish; breast and belly white. The dorsal fin dusky, with an oblong black spot on the middle; the posterior membrane streaked with three dusky-yellow fillets. The pectoral fin purplish, but on the under side green; the anal dusky, like the dorsal, without streaks. The caudal streaked transversely with yellow fillets.

Length, five inches.

A variety of this fish was brought of a light-gray colour.

No. CLXI.

TRIGLA *capite crusta ossea, scabra, rufa; pinnula singulari ad pinnas pectorales.*

The TRIGLA with a head covered with a rough, bony, reddish crust; a singular pinnula (or wing) at the pectoral fins.

Trigla volitans Linn. S. N. p. 498.

Called by the Natives MOOREE GODOO.

B. vi. *D.* $\frac{5}{5}$. 8. *P.* 28. *V.* 5. *A.* 6. *C.* 12.

THE *body* wedge-form, roundish, very small towards the tail, scabrous, covered with small orbicular scales, highly carinate in the middle, forming longitudinal, rough rows on the back: the scales on the belly smooth.

The *head* broader than the body, sub-tetragonal, a little rounded before; the rostrum short, furrowed, obtuse; crown flat, with a thick, rough, bony covering, or plate, divided by engraved lines into compartments

of divers forms, but chiefly lozenge, and extending into two long, acute, triangular processes, which reach the first dorsal fin. The mouth horizontal, under the rostrum, rather large; lips thickish. Jaws extractile, the under shorter than the upper. The teeth small, numerous, granulous. Tongue short, round, obtuse, smooth, bridled. Palate smooth. Eyes supreme, large, orbicular, protuberant, iris yellow; the superior edge of the orbit sharp, and by rising high on each side makes the crown appear deep channeled. Nostrils double, in a groove before the orbit.

The branchial opercula consist of three squamous laminæ, rough, angular: the first oblong-triangular, margin serrated; the margin of the second lengthened into a long, sharp, serrated process; the third small, ending in a pointed, soft flap. The branchial membrane partly exposed, consisting of six rays, the two lower very small, the others distinct, distant, and united by what might be called a seventh ossicle. The aperture lateral, small.

The *trunk*. The back nearly straight, furrowed, sides convex; abdomen and throat bellied, but sometimes plane; the tail a little angular, compressed.

The branchiæ tuberculate on the inner side. Lateral line not visible.

The *fins*. Two dorsal: the first of five, soft, declining spines; the second of eight simple rays, declining a little also. The pectoral fins expand into wings as long as the body, the first and last rays shortest, giving the wing a rounded appearance: the last rays of the wing gradually shorten, as in the figure. The ventral fins are long, narrow, acuminate; the anal, opposite to the second dorsal, has six assurgent, ramous rays; the caudal slightly falcate.

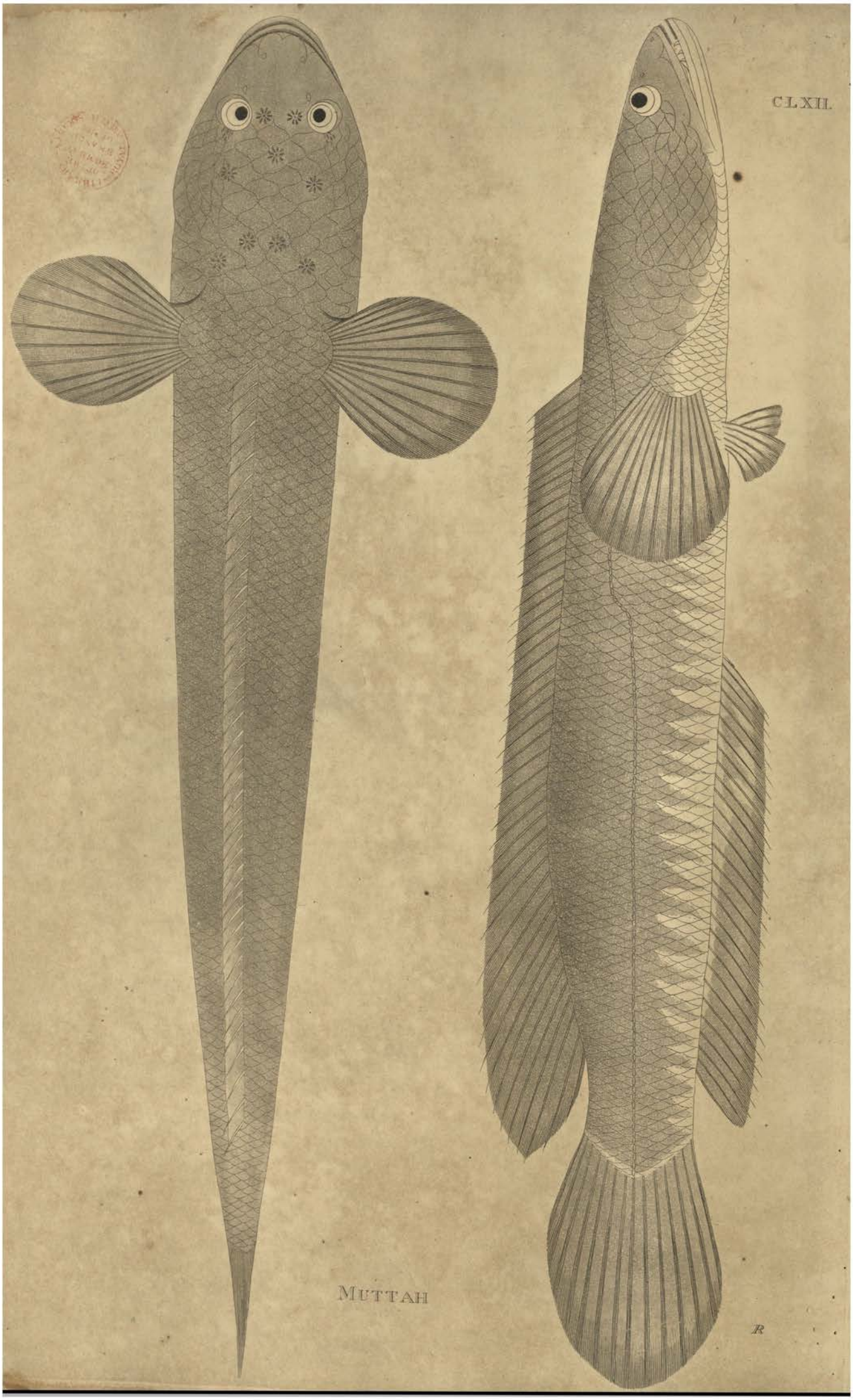
At the division of the bony processes on the back, there is a single soft ray exceeding an inch in length; between which and the dorsal fin is an oval-form prickle pointing backwards, and another similar between the first and second dorsal fin. On each side of the tail, at nearly equal distances, between the second dorsal and caudal fins, are three remarkable semilunate, serrated squamæ.

The *colour*. The head and back of a dark red, with some round spots of dusky-green; the sides of a lighter red; belly white; dorsal, pectoral, and caudal fins, are spotted also with dark green spots; the ventral and anal light coloured.

Length, usually eleven inches; but the subject drawn did not exceed seven.

REMARK.

This species of flying fish is not common at Vizagapatam.



MUTTAH

OPHICEPHALUS.

GENERIC CHARACTER.

Caput depressum, squamis variis. Bloch. | The head depressed, with scales of an unusual and different shape from those on the body.

No. CLXII.

Ophicephalus *corpore lanceolato, squamoso, lubrico; linea lateralis infracta; pinnis pectoralibus caudæque rotundatis.*

The Ophicephalus with a lanceolate, squamous, lubricous, body; the lateral line infracted; the pectoral and caudal fin rounded.

Ophicephalus striatus Bloch. Part x. *p.* 117. *Tab.* 359.

Called by the Natives Muttah.

B. v. *D.* 45. *P.* 15. *V.* 6. *A.* $\frac{1}{26}$. *C.* 14.

The *body* lanceolate, roundish, compressed, squamous, lubricous. The scales on the head very different in shape from those on the body.

The *head* broader than the body, depressed, hardly declivous, covered with remarkably large, bony, angular scales, contiguous, not imbricate; the rostrum naked. The mouth wide, horizontal, rounded; lips thin; jaws extractile, the under somewhat longer. The fore teeth above and below, in several rows, close and small: in the under jaw behind are some larger curve teeth. The tongue short, sharp, smooth, free. On each side of the palate a phalanx of small teeth. The eyes supreme, near the rostrum, small, round, the iris orange, the orbit deep. Nostrils double, round; one close to the orbit, the other on the verge of the rostrum: near the latter a small tubulus, hardly visible in the dead subject. The branchial opercula oblong, squamous, the posterior margin ciliate; the membrane exposed; the aperture arched, lateral and gular.

The *trunk*. The back almost straight, declining very gently towards the tail. The abdomen straight, convex; the sides rounded at the shoulders, more compressed towards the tail. The branchiæ tuberculate, and rough. The lateral line conspicuous, not carinate; slopes gently from the upper edge of the opercula till on a line with the eleventh ray of the dorsal fin, then bends abruptly, and runs straight along the middle of the tail. The anus nearer the head than the caudal fin.

The *fins*. The dorsal, consisting of forty-five ramous rays nearly of equal length till near the end, possesses the whole of the back from the shoulders to within less than an inch of the tail; the pectoral round, of moderate size; the ventral very short; the anal little more than half the length of the dorsal, but similar in shape; the caudal oblong, round.

The *colour* of the head and back very dark, or nearly black; approaching the lateral line it grows a few shades lighter, and, extending over it, forms a row of oblong-conical marks pointing downwards, the interstices

between which are nearly of the same colour with the abdomen and under part of the tail, viz. a dull reddish-white. The fins not so black as the back; the ventral alone are light coloured.

The *length* of the subject described, sixteen inches.

REMARKS.

The Ophicephalus was not known to Linnæus, nor is it found in Gmelin's edition of the Systema Naturæ. From specimens received from Tranquebar, the new genus was formed by Bloch, from whom I have borrowed the Generic Character.

No. CLXIII.

OPHICEPHALUS *corpore oblongo, squamis magnis, rotundis, punctatis; linea laterali infracta; pinnis pectoralibus caudæque rotundatis cum acumine.*

The OPHICEPHALUS with an oblong body, large, rounded, dotted scales; the lateral line infracted; the pectoral fins, and the caudal round, with a small point.

Ophicephalus punctatus Bloch. Part x. *p.* 117. *Tab.* 358.

Called by the Natives SOWARA'H.

B. v. *D.* 45. *P.* 17. *V.* 6. *A.* 26. *C.* 14.

THE *body*. This fish in shape differs from the last. It is rather oblong than lanceolate, rounder at the shoulders, more compressed near the tail, and bends from the anus gently upward to the end of the anal fin. The scales are larger, orbicular, and all, except on the abdomen, marked with a cluster of small black dots on the anterior part. The body, as in the former fish, lubricous.

The *head*. There is little difference in the shape of the head; but the scales on the crown are here only larger than those on the trunk, of the same form, and imbricate. The marginal row of teeth more complete. The tubuli on the edge of the rostrum less conspicuous. The mouth, tongue, palate, eyes, nostrils, and branchial membrane; the branchiæ, lateral line, and position of the anus, as already described in the MUTTAH.

The first lamina of the operculum obtusely angular, the second acuminate.

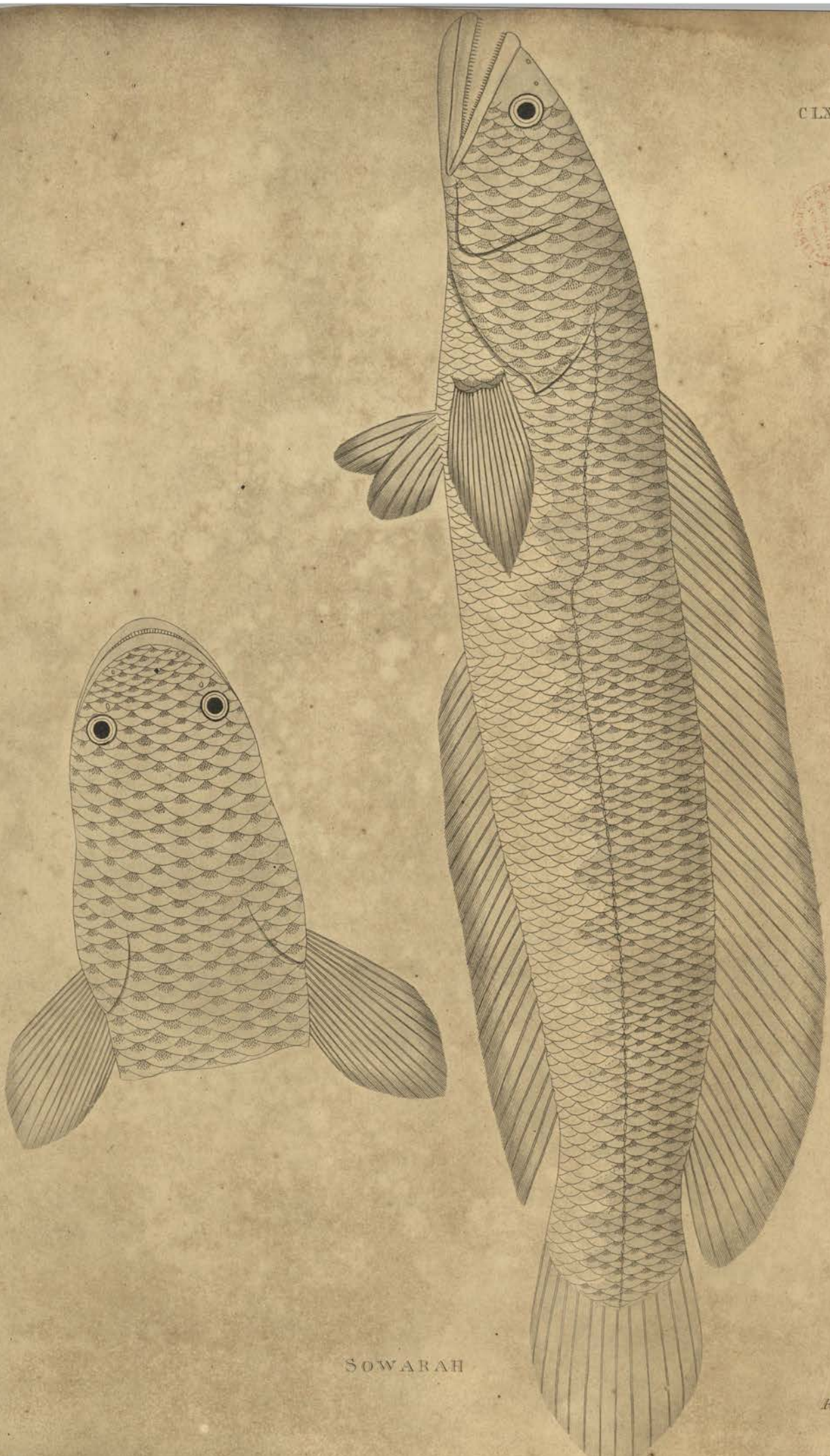
The *fins*. The dorsal and anal are alike in both fish, except the want of a spine in the latter fin; the pectoral and caudal are pointed as well as round; the ventral more obtuse, and proportionally longer.

The *colour* less dusky, with an obscure tinge of green. A regular row of angular marks, of a colour lighter than that of the back, forms a denticulate border to the lateral line, from its infraction to its end. Beneath these the colour is a yellowish white. The dorsal, anal, and caudal fins, with a greenish cast, are less dusky than the back; the pectoral and ventral of a yellowish dusky white.

The *length*, one foot six inches.

REMARKS.

This fish was brought in the month of July, in a jar of water, from the lake of Ankapilly, and lived several days. They survive many hours even out of water.



SOWARAH

No. CLXIV.

OPHICEPHALUS *corpore lanceolato, purpurascente; pinnis pectoralibus radiis duodecem, striatis.*

The OPHICEPHALUS with a lanceolate, purplish body; a pectoral fin of twelve rays, striated transversely.

Called by the Natives KORA MOTTA.

B. v. *D.* 36. *P.* 12. *V.* 5. *A.* 23. *C.* 14.

THIS fish has only twelve rays in the pectoral fin, and five in the ventral. In most of the other characters it agrees better with the Muttah, No. CLXII. than with the one last described.

In colour it differed from both. The back a cast of dusky purple, the breast bluish, the abdomen dark gray. The dorsal and part of the anal fin of the same colour as the body; the hinder portion of the dorsal a dark orange; the pectoral streaked transversely black and yellow; the points of the caudal rays distinctly separate, and tipped yellow.

The *length* of the subject, six inches.

REMARKS.

None of this genus were ever caught in the sea or in the river. I found them in the lakes of Ankapilly and Casem Cottah, as also in a tank close to Vizagapatam.

It has been already remarked that, like eels, they may be long preserved alive in fresh water.

PISCES ABDOMINALES.

FISHES WHOSE VENTRAL FINS ARE SITUATED BEHIND THE PECTORAL FINS, OR ON THE ABDOMEN.

SILURUS.

GENERIC CHARACTER.

Caput nudum, magnum, latum, compressum; os cirris aliquot tentaculatum; rictus et faux ampla; labia crassa; mandibulæ dentatæ; lingua crassa, lævis, brevissima. Oculi parvi. Membrana branchiostega radiis iv.—xvi.

Corpus elongatum, compressum, squamis nudum, muco tenace obductum; linea lateralis dorso propinqua; pinnarum pectoralium aut dorsalis radius primus spinosus retro dentatus. GMELIN.

The head naked, big, broad, compressed. Some cirri at the mouth; the mouth and throat wide; lips thick; the jaws denticulate; the tongue thick, very short, smooth. Eyes small. From four to sixteen rays in the branchial membrane.

The body elongated compressed, without scales; covered with a slimy mucus; the lateral line near the back; the first ray of the dorsal or the pectoral fin, spinous, and serrated behind.

No. CLXV.

SILURUS *corpore longo, cultrato; pinna dorsali unica, quinque radiata, radio primo serrato; cirris quatuor; cauda falcata, lobis inequalibus.*

The SILURUS with a long knife-form body; a single dorsal fin consisting of five rays, the first serrated; four cirri; a falcate tail with unequal lobes.

Called by the Natives WALLAGOO.

B. xix. *D.* $\frac{1}{5}$. *P.* $\frac{1}{16}$. *V.* 10. *A.* 91. *C.* 19.

THE *body* long, compressed, without scales, adipose, slippery.

The *head* depressed, covered with the common skin, through which the sutures are visible; the rostrum short, rounded. The mouth oblique, large, wide, with hardly any lips. Jaws not extractile, nearly equal; both full of numerous, small, crooked teeth, close, disposed in many ranks; those in the inner ranks largest.

WALLAGOO

INGEELEE

CHINTA JELLAH

R

Tongue short, blunt, smooth, white, fixed. Palate and throat set with numerous recurve teeth. Eyes distant from each other, remarkably small, round, protuberant. Nostrils double, small, oval, near the orbit; besides which a small round aperture is found between the roots of the long cirri and the point of the rostrum, on each side.

The branchial opercula two-leaved, semicircular, smooth, the posterior lamina ciliate; the membrane halt exposed, the aperture large.

There are four cirri; one from each side of the rostrum, and two from the lower jaw: the former five inches and a half long, the other one inch.

The *trunk*. The back almost straight, convex; the sides roundish, compressed; the breast and abdomen full and rounded, but near the anus flattish; the tail taper, compressed. Branchiæ four-leaved, the denticles conical, a little curve. Lateral line conspicuous, high, at first straight, then bending a little upwards. The anus distant from the tail.

The *fins*. The dorsal solitary, scapular, anterior surface of the first ray scabrous; the pectoral low, broad, acuminate above, first ray slightly serrated; ventral small, short; anal very long, nearly equal; the caudal divided into two very unequal falcate lobes.

The *colour* of the head and back a dark leaden, brighter on the sides; the breast and abdomen a dull white. Fins a little lighter than the back.

Length one foot three inches, but I have seen them three feet long.

REMARKS.

None of this genus are brought to European tables, being excessively rank and oily; they are eaten however by the natives of the lower class.

They are chiefly found in lakes or in large tanks. In the neighbourhood of the Ankapilly lake, the weavers employ the dried jaw bones of the present species, as an instrument for carding the finest sort of cotton. A figure is given of the dried bone.

No. CLXVI.

SILURUS *pinna dorsalis analisque caudali unitæ; cirris octo; cauda cuspidata.*

The SILURUS with the dorsal and anal fins united with the caudal, eight cirri; a sharp pointed tail.

Platystacus Anguillaris Bloch. Pl. 373.

Called by the Natives JNGEELEE.

B. xiv. *D.* $\frac{1}{5}$. *D.* e. *A.* 274. *P.* $\frac{1}{10}$. *V.* 14.

THE *body* ensiform, compressed, without scales, lubricous.

The *head* large, long, depressed, as broad as the body, smooth. The mouth, under the round, obtuse, projecting rostrum, horizontal, wide; lips adipose, flabby. Jaws large, rounded, the upper longer than the under. Teeth in several rows, in the anterior part of the jaws small, sub-granulous: in the upper jaw very minute. Tongue very short, retracted, smooth. Palate wide, with teeth in a triangular phalanx: teeth also in the fauces. Eyes small, distant, orbicular. Nostrils single, distant from the orbit, large, linear-oval.

Branchial opercula one-leaved, rounded, bridled beneath; membrane broad, mostly hid; aperture arched.

The cirri of equal length, very short, one from each corner of the mouth; one from each nostril, and four from the chin.

140562

The *trunk*. The back declines very gently towards the tail; the sides compressed, a little convex; the tail taper, flattish. The two exterior branchiæ pectinate, the next two tuberculate, and there is a fifth small leaf, both denticulate and pectinate. Lateral line high, straight. The anus distant from the tail.

The *fins*. There are two dorsal, the first scapular, armed with a serrated spine; the second rising about the middle of the back, runs parallel with the opposite anal, and both are blended with the pointed caudal fin. The pectoral low, lanceolate, and, like the dorsal, armed with a serrated spine; the ventral distant from the head, small, lanceolate.

The *colour*. The head and trunk above the line, blackish, the sides a dull copper, the belly and throat bright lead. From the rostrum to the tail, on both sides, are two whitish lines, and a third from the pectoral fin. The fins are nearly as dark as the back, the ventral excepted, which are lighter and glassy.

The *length* of the subject described seven inches; but one caught in the river measured two feet seven.

No. CLXVII.

SILURUS *pinna dorsali postica adiposa; cirris sex, quorum duo longissimi; cauda biloba falcata, setacea.*

The SILURUS with an adipose dorsal fin; six cirri, two of which very long; a bilobe falcate, setaceous tail.

Called by the Natives CHINTA JELLAH.

B. iv. *D.* $\frac{1}{8}$. 0. *P.* $\frac{1}{9}$. *V.* 6. *A.* 17. *C.* 18.

THE *body* sub-lanceolate, round and slender towards the end of the tail. No scales, but the back rough, and behind the vertex looks as if studded with golden pins.

The *head* sharp, ovate, rough; the rostrum projects over the mouth, which, as well as the lips, jaws, teeth, and palate, agree with the last species. The two longer cirri rise from the sides of the rostrum near the point.

The *trunk*. The back acclivous to the first dorsal fin, between which and the spurious fin almost straight, and then declines rather abruptly to the tail. The lateral line after waving gently till opposite to the anal fin, proceeds straight to the middle of the caudal fin: and a second line rising also from the operculum, bends obliquely to its termination at the ventral fin.

The *fins*. The first dorsal armed with a strong spine, a little curve, rough, serrated; the rays slightly falcate: the second stands on the declivity where the tail grows roundish; the pectoral is armed like the dorsal and of a like shape; the ventral fin very small; the caudal falcate and setaceous.

The *colour* on the upper parts a dull leaden: the breast and belly whitish.

The *length* four inches eight lines.

MARPOO

No. CLXVIII.

SILURUS *pinna dorsali unica, longissima ; cirris octo. Cauda rotunda.*

The SILURUS with a single, very long, dorsal fin ; eight cirri ; and a round tail.

Silurus Anguillaris, Linn. S. N. p. 502.

Called by the Natives MARPOO.

B. ix. *D.* 69. *P.* $\frac{1}{9}$. *V.* 6. *A.* 50. *C.* 18.

THE *body* oblong, somewhat roundish, without scales, adipose.

The *head* large, as broad as the body, depressed, grooved, covered with a roughish skin, through which the divisions of the cranium are visible. The rostrum short, rounded at the margin, projecting a little over the mouth. The mouth transverse, large; lips thin. The lower jaw shorter than the upper ; both set with several rows of small, curve teeth. Tongue short, retracted, smooth, but the palate rough. Eyes small, nostrils double, distant from each other, and nearer the rostrum than the orbit. Branchial opercula one-leaved; the membrane partly hidden, aperture gular. The cirri eight in number: two larger and shorter than the others, from the upper lip; one from each posterior nostril, and four from the lower jaw.

The *trunk* rounded about the shoulders, grows more and more compressed towards the tail. The branchiæ denticulate. Lateral line high, straight, hardly slanting. The anus distant from the tail.

The *fins*. The solitary dorsal rises near the shoulder, is slightly assurgent, and continued to within half an inch of the caudal fin; the pectoral armed with a strong serrated spine; the ventral near the anus, shorter than the pectoral, acuminate in the middle; the anal shorter than the dorsal, but corresponds in shape; the caudal fin distinct, orbicular.

The *colour*. The upper part of the head and back nearly black, the sides, under the line, from a dusky purplish changes to a dull white, the colour of the abdomen and breast.

Length of the subject ten inches.

REMARKS.

I caught this fish when angling in a tank at Tartoor, and with some surprise recognised an old Aleppo acquaintance. I never met with the species at Vizagapatam.

No. CLXIX.

SILURUS *pinna dorsali postica adiposa; cirris sex; cauda falcata, lobis inequalibus.*

The SILURUS with a hinder adipose, dorsal fin; six cirri; a falcate tail, with unequal lobes.

Called by the Natives DEDDI JELLAH.

B. iv. *D.* $\frac{1}{8}$. 0. *P.* $\frac{1}{12}$. *V.* 6. *A.* 16. *C.* 20.

THE *body* oblong, roundish, compressed, lessening and rounding towards the tail; without scales, adipose, lubricous.

The *head*, large, broad, depressed; the crown rough; the rostrum obtuse, projecting over the mouth. The mouth, lips, jaws, teeth, and palate, as before described in No. CLXVI. The tongue fleshy, thick, obtuse, smooth, fixed. The eyes oval, large; the nostrils also large, and between them is a small mucous aperture. The branchial membrane has four rays. There is a cirrus at the corner of the mouth on each side, and four shorter from the lower jaw. The lateral line at first bends downward, but from above the ventral fin runs straight to the tail: a second line rising under it, (as in No. CLXVII.) forms an inverted arch, which terminates at the anal, not the ventral, fin. The anus nearer the tail than the head.

The *fins*. The first dorsal armed with a strong spine, serrated on both sides; the ramous rays acuminate above; the spurious adipose fin distant, opposite to the anal. The pectoral very low, armed also with a strong, serrated spine; the ventral remote, short; the rays of the anal declining from its rise; the caudal fin falcate, the upper lobe considerably longer than the under.

The *colour* a darkish leaden on the upper part of the head and back; the parts below lighter; the breast and belly white, not splendent.

	Inches.	Lines.
The *length*, from the rostrum to the caudal fin - -	8	8
caudal fin - - - -	2	6

REMARKS.

This species is abundant at Vizagapatam, but eaten only by the lower class. It rarely exceeds one foot in length. The double lateral line in this and in No. CLXVII. is remarkable.

DEDDI JELLAH

NALLA JELLAH

WANA MOTTA

R

No. CLXX.

SILURUS *pinna dorsali postica adiposa; cirris sex; cauda sub-lunata.*

The SILURUS with an adipose hinder dorsal fin; six cirri; and a sub-lunated tail.

Called by the Natives NALLA JELLAH.

B. iv. *D.* $\frac{1}{8}$. 0. *P.* $\frac{1}{10}$. *V.* 6. *A.* 29. *C.* 19.

THE *body* oblong-ovate, roundish, compressed, adipose.

The *head* broad, depressed; the jaws equal, mouth small; teeth, tongue, and palate, as in the last. The eyes smaller; the nostrils contiguous, close to the point of the rostrum, the anterior very small; the opercula so close, that the branchial membrane cannot easily be got at. A cirrus two inches and a half long, from each side of the nose; and four, less than half that length, from the under jaw. The lateral line oblique, not conspicuous; the branchiæ, and anus, as in the last.

The *fins* in their situation and shape as described in the last, only that the caudal is here sub-lunate.

The *colour* of the head and back a bluish leaden, the belly, throat, and hinder part of the tail, a dull white. The whole trunk strewed with small, obscure, dusky dots. The dorsal, ventral, and anal fins have blackish margins; the pectoral and caudal glossy, with a faint yellowish cast.

Length of the subject, nine inches.

No. CLXXI.

SILURUS *cirris carens; pinna dorsali postica adiposa; cauda trifida; pinnis inermibus; ventrales longissimæ.*

The SILURUS without cirri; the hinder dorsal fin adipose; a trifid tail; the fins without spines, and the ventral fins very long.

Called by the Natives WANA MOTTA.

B. xxiv. *D.* 12. 0. *P.* 10. *V.* 9. *A.* 15. *C.* 17.

THE *body* sub-lanceolate, roundish, compressed, without scales, soft, adipose, white, pellucid.

The *head* small, long, declivous, compressed, obtuse, the front depressed, scabrous. The mouth low, transverse, large, wide, no lips. The jaws long, narrow, the upper emarginate, fixed; the inferior somewhat longer, boat-shape, moves in a wide range: both are full of teeth. The teeth dissimilar, some of the front and the marginal (particularly below) larger, conical, recurve; the others linear, crowded, or in many rows. Tongue very small, short, denticulate, immoveable. The palate narrow, denticulate. Eyes remarkably close to the rostrum, in a deep, long orbit, very small, orbicular. Nostrils double, near each other, the first smallest, round, the posterior oval. The branchial opercula consist of a single soft lamina, open below; the membrane exposed; the aperture wide, lateral, and gular.

The *trunk*. The back from the shoulders to the spurious fin slightly arched, it then rises a little towards the caudal fin, the tail becoming much broader near the fin; the breast and abdomen almost straight, convex; the sides compressed but roundish. The branchiæ have acerose denticles. Lateral line high, nearly straight, slightly raised. The anus remote.

The *fins*. The dorsal consists of twelve soft descending rays, the first two inches long, the last half an inch; the adipose fin, distant, very small; the pectoral remarkably high, sub-falcate, setaceous, the longest ray two inches three lines; the ventral opposite to the dorsal, setaceous, the first ray two inches eight lines long; the anal opposite to the adipose fin, of the same shape as the dorsal, the first ray about one inch in length; the caudal fin is of a singular form, being divided into three lobes, setaceous at the point: each of the lateral lobes consists of seven or eight rays, not including the small accessory rays on the sides; the middle lobe a pyramidal shape ending in a setaceous thread, and pinnated on the sides, but not more than three or four rays can be distinctly counted; it is a little longer than the lateral lobes, and measures one inch and a half.

The *colour* a yellowish-white sprinkled with minute blackish dots, especially behind the anal fin. The fins are of the same colour with the body, but not dotted.

Length, nine inches.

REMARKS.

This fish is found only in the sea, and not common at Vizagapatam.

It is flabby, oily, and grows rancid remarkably soon.

SALMO.

GENERIC CHARACTER.

Caput læve. Dentes in maxillis, lingua. Membrana branchiostega radiis iv.—x. *Pinna dorsalis postica adiposa; pinnæ ventrales multiradiatæ.*

The head smooth; teeth in the jaws and in the tongue. The branchial membrane from iv. to x. rays. The hinder dorsal fin adipose; the ventral fins composed of many rays.

No. CLXXII.

SALMO *capite elongato; maxillis inequalibus, dentibus numerossimis extrà exasperatis; linea laterali loricata.*

The SALMO with an elongated head; jaws of unequal length, armed on the outside with numerous teeth; the lateral line loricated.

Called by the Natives BADI MOTTAH.

B. xii. *D.* 12. *P.* 14. *V.* 9. *A.* 11. *C.* 18.

THE *body* lanceolate, compressed, roundish, squamous. Scales large, rounded, at the base truncate, imbricate, loose.

The *head* small, depressed, sub-compressed on the sides, upper part squamous. The mouth very large, nearly horizontal; without lips. The jaws long, straight, the under a little shorter than the upper; both

NATURAL HISTORY MUSEUM LIBRARY

BADI MOTTAH

R

furnished externally with innumerable teeth, besides an interior row of small crooked teeth, Tongue short, blunt, awl-shape, denticulate, hardly moveable. The palate narrow, set with many teeth. The eyes supreme, near the rostrum, moderate size, orbicular, prominent. Nostrils double. The branchial opercula rounded, without scales; the membrane half concealed, the aperture wide.

The *trunk*. The back slightly arched, roundish; sides convex. Abdomen a little prominent, flattish; tail small, roundish. The branchiæ denticulate. Lateral line high, straight, loricate. The anus remote.

The *fins*. The dorsal consists of twelve declining rays, and is opposite to the ventral. The pectoral middle, short; the ventral of the same shape with the dorsal, but the rays shorter; the anal fin remote, opposite to the adipose dorsal, and much smaller than the ventral; the caudal bifid.

The *colour* a dusky yellowish; the breast and abdomen a dull white. The ventral and anal fins whitish; the others a little lighter than the trunk.

The *length* of the subject eight inches; I saw none that exceeded ten.

REMARKS.

Though the body, like that of the Smelt, is transparent, and in appearance when boiled resembles the Indian Whiting No. CXIII.; it is a very dry and insipid fish.

This was the only species of Salmon I met with in India; but I find another in Bloch, which he received from Tranquebar, and describes under the name Salmo Tumbil. Part X. p. 100. Tab. 430.

FISTULARIA.

GENERIC CHARACTER.

Caput: rostrum cylindricum, apice maxillosum. Membrana branchiostega radiis vii.

The rostrum cylindrical, with maxillæ at the apex; the branchial membrane consists of seven rays.

No. CLXXIII.

FISTULARIA *cauda bifida, in setam longam terminante; pinna dorsali remotissima.*

The FISTULARIA with a bifid tail, terminating in a long seta; the dorsal fin very distant from the head.

Fistularia tabacaria Linn. S. N. p. 515.

Called by the Natives GOORUM.

B. v. *D.* 14. *P.* 15. *V.* 6. *A.* 13. *C.* 16.

THE *head* naked, depressed, and chanelled above, a little compressed on the sides, and projecting into a long tubular rostrum, at the extremity of which is placed the mouth. The rostrum two inches and a half long, not quite round, but striated or grooved above and below, and armed on the sides, two-thirds of its length, with a row of small prickles bent forwards. The extremities of this rostrum form the jaws; the under longer than the upper, both tuberculate at the points, and furnished with minute retroflex teeth, not close, but regular. The mouth transverse, narrow, yet by the free motion of the lower jaw it can enlarge itself considerably. The tongue small, fixed, and, as well as the palate, feels rough to the finger. Eyes supreme, large, oval, prominent; the edges of the orbit striate, angular. Nostrils double, nearly of equal size, the posterior on the edge, the anterior within a small furrow, surrounded with minute prickles. The branchial operculum one oblong lamina; the branchial membrane half covered; the aperture gular and long.

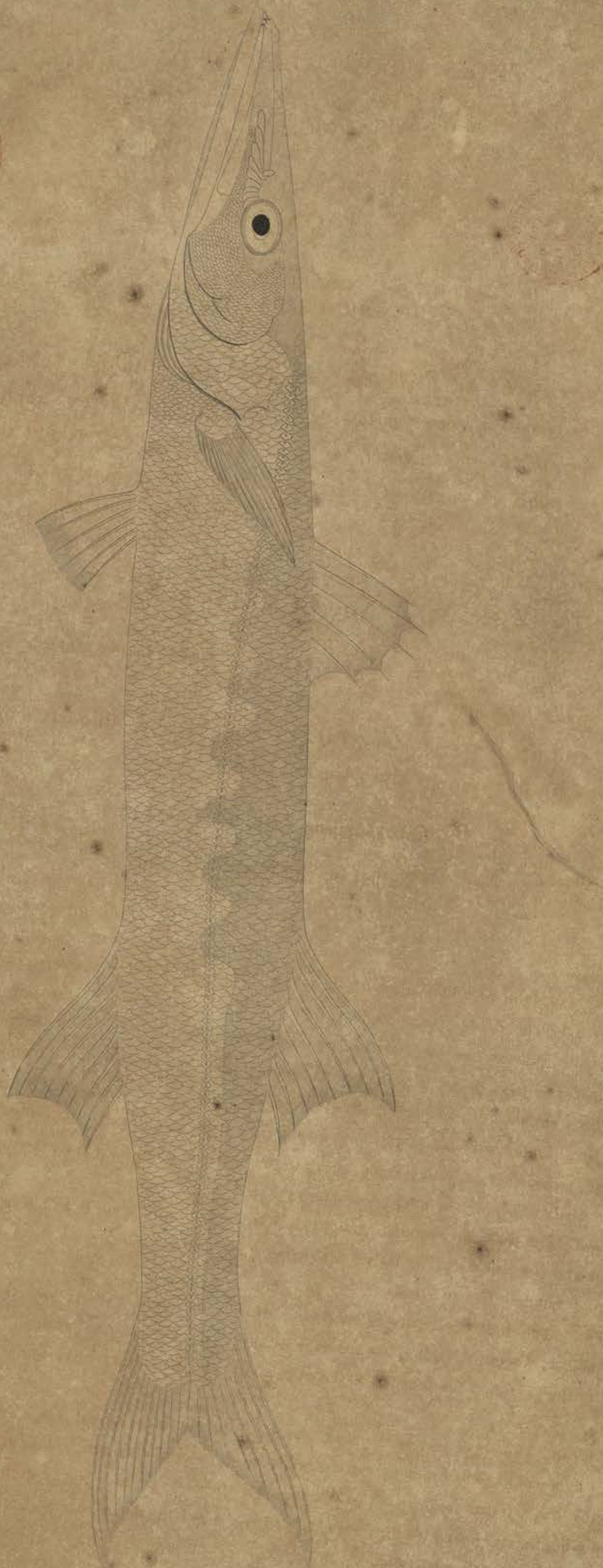
The *trunk*. The back depressed, almost straight to the dorsal fin, from which it is carinate; the abdomen and breast flat; the hinder part of the trunk somewhat angular. The branchiæ four-leaved, tuberculate. The lateral line middle, straight, carinate towards the end. The anus remote.

The *fins*. The dorsal single, remarkably remote, low, assurgent; pectoral low, pointed above; the ventral very small, much nearer the head than the tail; the anal opposite to the dorsal, and nearly of the same shape and size; the caudal bifid, with a setaceous tail, three inches long.

The *colour* omitted to be set down when the fish was recent.

	Inches.	Lines.
The *length* of the subject described, from the point of the rostrum to the division of the caudal fin	9	0
From the point of the rostrum to the eyes	2	7
hind head to the dorsal fin	3	2
pectoral to the anal fin	2	8
dorsal fin to the caudal	1	0

GOORUM



JELLOW

ESOX.

GENERIC CHARACTER.

Caput supra planiusculum: mandibula superiore plana, breviore: inferiore punctata. Dentes in maxillis, lingua. Membrana branchiostega radiis vii —xii. *Corpus elongatum.*

The head flattish above; the upper mandible plane, shorter: the lower dotted. Teeth in the jaws and tongue. The branchial membrane of vii. to xii. rays. The body elongate.

No. CLXXIV.

Esox *maxilla inferiore longiore, oblique truncata; pinna prima dorsali spinosa, quinque radiata; cauda falcata.*

The Esox with the lower jaw longer than the upper, and obliquely truncate; the first dorsal fin with five spinous rays: the tail falcate.

Esox sphyræna Linn. S. N. p. 515.

Called by the Natives Jellow.

B. vii. *D.* $\frac{5}{5}$. 10. *P.* 14. *V.* 6. *A.* 9. *C.* 20.

The *body* long, straight, roundish, covered with scales proportionally small.

The *head* long, conical, somewhat angular, with a long projecting rostrum; the crown and front depressed, not smooth like the rest, and the rostrum has a ridge on each side. The mouth very large, a little oblique; the lips thin. The jaws projecting, of unequal length; the upper shorter than the under, which is obliquely truncate; both set with crooked teeth, not crowded, of dissimilar size, and one remarkably large in front of the under jaw. The tongue and palate denticulate. Eyes high, large, oval; nostrils at the root of the rostrum. The opercula large, rounded, both laminæ squamous, the posterior terminates in two pointed flaps. The branchial membrane partly exposed; the aperture wide.

The *trunk.* The back and abdomen straight; the sides convex; the tail from the rise of the anal fin, somewhat taper and compressed. The lateral line rising high, descends sloping to the middle of the trunk, then straight and middle. The anus remote.

The *fins.* The first dorsal nearly scapular, has five declining spinous rays, in a groove, the second distant, lumbar, somewhat falcate, has ten ramous rays; the pectoral middle, short, acuminate; the ventral as long as the pectoral, but broader, and not pointed; the anal exactly like the second dorsal; the caudal falcate.

The *colour.* The upper part of the head, and the trunk above the lateral line, a darkish changeable green; the sides light-colour; the lower part of the head, the throat, and abdomen, a dull, not splendent, white. Near the lateral line, the dark colour (but less changeable than on the back) is continued a little across the line, forming a border indented with the light colour of the sides; the dorsal, pectoral, anal, and caudal fins, are of a greenish yellow; the ventral white.

The *length*. The subject described measured two feet two inches; but in the month of September, one was caught of four feet eight.

REMARK.

It sometimes appears at the English tables, but is not esteemed.

No. CLXXV.

Esox *maxillis longissimis, sub-equalibus, denticulatis; cauda sublunata.*

The Esox with very long maxillæ, nearly of equal length, and denticulated; a sub-lunate tail.

Esox Belone Linn. S. N. p. 517?

Called by the Natives WAHLAH KUDDERA.

B. xii. *D.* 23. *P.* 15. *V.* 6. *A.* 21. *C.* 20.

THE *body* long, straight, roundish, but somewhat quadrate; covered (on the belly particularly) with very small scales, smooth, angular-form, tenacious.

The *head* small, without scales, depressed above, striate and smooth, compressed on the sides, with a straight projecting rostrum, four inches in length, bony, round, sharp-pointed, constituting the two maxillæ, of which the under is a little longer than the upper; both furnished with a row of straight awl-form teeth, unequal in size, sometimes diverging, distant from each other, the interstices filled up by thickset, minute teeth, in several rows. The mouth opens widely; the tongue oblong-ovate, small, a little round, and not quite fixed. Palate narrow, smooth. The eyes large, oval, near the angle of the mouth; the nostrils in a groove, on a line with the upper edge of the orbit; the posterior oval, the other round; both small. The branchial opercula large, rounded; the first lamina squamous, the second without scales, acuminate. The membrane exposed, the aperture large.

The *trunk*. The back and abdomen almost straight, till where the tail begins to taper at the anal fin; the sides convex, the belly below, rather flat; the tail tapers more than the last. The exterior branchiæ denticulate, the others tuberculate. The lateral line supreme, straight, a little raised towards the end. Another line of very small tubercles runs parallel to it, from below the edge of the pectoral fin to the tail. The anus remote.

The *fins*. The dorsal solitary, very near the tail, consists of twenty-three ramous rays, the first ten declining, sub-falcate, the others short, assurgent. The pectoral fin middle, short, rounded above, assurgent to the eighth ray; the ventral ramous, remote, slightly falcate; the anal in shape exactly like the dorsal, to which it is opposite, but shorter; the caudal bilobed, somewhat lunate, the upper lobe shortest.

The *colour* of the upper part of the head greenish, the cheeks and throat smooth, splendent, silvery. The back changeable, dark green and light blue; the sides light, silvery; the belly white: the dorsal, pectoral, and caudal fins have a greenish tinge, the others a yellowish-white.

	Feet.	Inches.	Lines.
Length of the subject described, from the point of the under jaw to the caudal fin	1	11	6
to the eye	0	4	7
flap of the operculum	0	6	5
ventral fins	1	0	7
of dorsal fin	0	4	7
anal fin	0	4	5
lower lobe of caudal fin	0	2	4

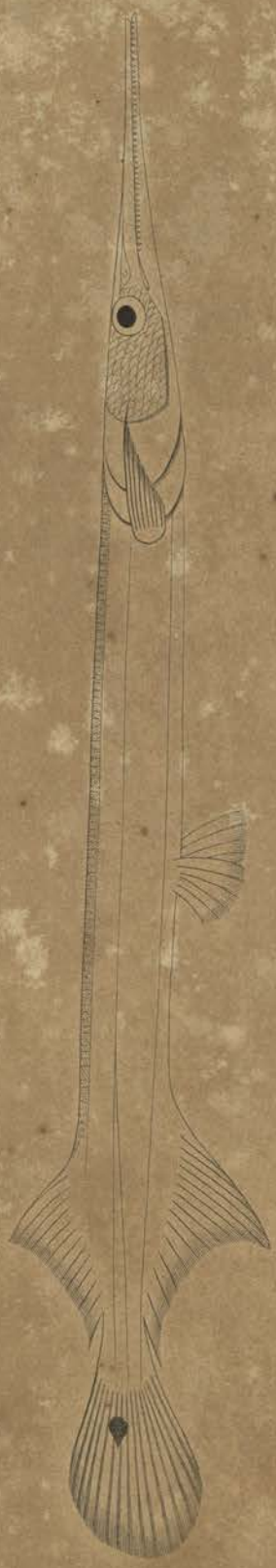
REMARKS.

This, like the former, is an indifferent fish for the table. The bones are green.

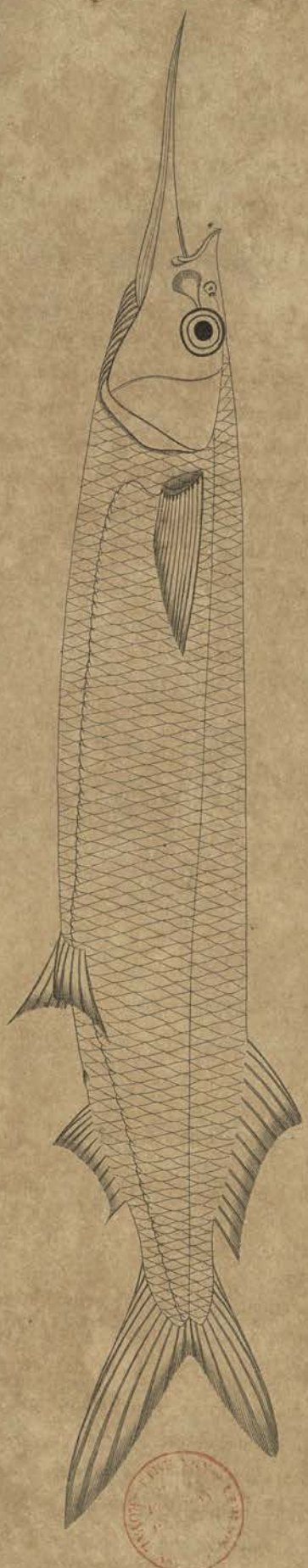
WAHLAH KUDDERA

Forgue

R.



KUDDERA A



KUDDERA. B

No. CLXXVI.

Esox *maxillis longissimis, dentatis; corpore alepidoto; cauda rotundata.*

The Esox with very long maxillæ set with teeth; the body without scales; the tail rounded.

Called by the Natives KUDDERA. A.

B. vii. *D.* 13. *P.* 9. *V.* 6. *A.* 16. *C.* 16.

THIS species in the shape of the body and head, and the structure of the mouth and jaws, agrees with the last described: they differ in the following respects. The cheeks are squamous; the body without scales, transparent; the branchial membrane has only seven rays; and the caudal fin is round, with a small black spot towards the root. The situation of the other fins, the lateral line, and the second line near the belly, are as described in the last; but the dorsal and anal fins are broader and shorter.

The *colour* whitish, clear, transparent. Along the back near the ridge, are three black lines, from the opercula to the dorsal fin. The fins are glassy more or less light colour; the tail yellowish-green, with a black spot, as already mentioned.

	Inches.	Lines.
Length from the point of the lower jaw to the caudal fin	10	6
to the dorsal fin - - - - - -	8	3
of dorsal fin - - - - - -	1	0
of anal - - - - - - - -	2	8
of caudal - - - - - - - -	1	2

No. CLXXVII.

Esox *maxilla inferiore tereti, cuspidata, longissima; superiore brevissima; cauda biloba.*

The Esox with a very short upper jaw, but the under jaw extremely long, round, sharp pointed; the tail unequally bifid.

Esox Brasiliensis Linn. S. N. p. 517.

Called by the Natives KUDDERA. B.

B. xii. *D.* 13. *P.* 12. *V.* 6. *A.* 12. *C.* 19.

THE *body* long, roundish, compressed, somewhat quadrate; covered with large, smooth, tenacious scales.

The *head* not so broad as the body, without scales, compressed on the sides, plane above. The mouth roundish, horizontal; no lips. The upper jaw short, under the rostrum: the under is extended into a long bony sword-form process, depressed above, grooved both above and below. The teeth in both jaws small, linear, close, without order. Tongue oblong, obtuse, smooth, loose. The palate smooth also, but the fauces rough. Eyes high, middle size, round, iris silvery. The opercula without scales.

The *trunk*. The lateral line supreme, straight, declining very gently; the other ventral line conspicuous, as in the two former, but bends more downwards, and the belly being more convex, is consequently less parallel to the lateral line. The anus, as in the others, remote.

The *fins*. The dorsal and anal fins as in the last species, but the ventral situated nearer the tail. The pectoral high, straight, acuminate above. The caudal fin differs from the last, being bilobed, or divided unequally: the lower lobe much the longest.

The *colour*. The crown and back changeable; the opercula, sides, and abdomen, silvery; the ventral and anal fins glassy-white; the others bluish, paler than the back.

Length of the subject described, from the upper jaw to the caudal fin, nine inches four lines.

No. CLXXVIII.

Esox *maxilla superiore brevi; inferiore longissima, subulata; corpore lineare; squamis variis; cauda biloba.*

The Esox with a short upper jaw; the under, awl-form and extremely long; the body linear, covered with scales of diverse shapes; the tail unequally bifid.

Called by the Natives KUDDERA. C.

B. xiii. *D.* 21. *P.* 9. *V.* 6. *A.* 18. *C.* 18.

THIS species, in the structure of the mouth and lower jaw, agrees with the last, but in the shape of the trunk, approaches nearer No. CLXXVI.; it differs however from all I have hitherto found described.

The *body* linear, compressed, squamous; scales imbricate, loose, but singularly varying in shape; some almost square, others oval or angular.

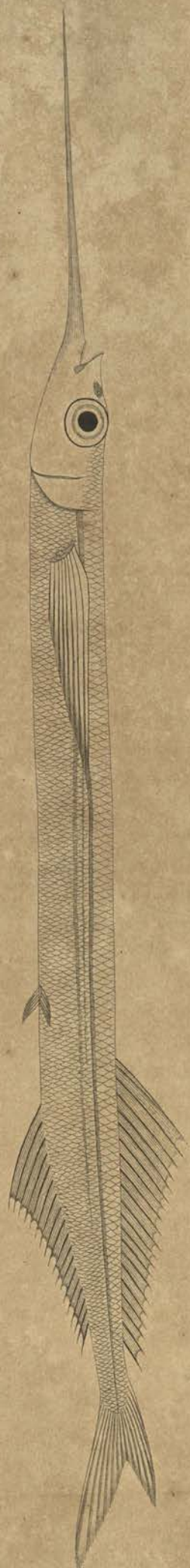
The *head* depressed, compressed, smooth, without scales, except on the crown; the front deeply grooved in the middle. The mouth as in the last species; the upper jaw short, the denticulate part of the under corresponding; but then it projects into a taper, sharp-pointed, bony, awl-shape process, three inches three lines in length. Teeth numerous, linear. Tongue roundish, small, cartilaginous, smooth, bridled; the palate rough. The eyes supreme, round, larger than in the last. The nostrils double, in a pit near the orbit. The opercula also, as in the last, without scales.

The *trunk*. The back straight, roundish, carinate; the sides compressed, the breast and abdomen attenuate, carinate, and straight to the anal fin, where the tail becomes narrower by the lower part slanting towards the caudal fin, for the upper edge hardly declines. The lateral line high, straight, parallel to the back. The lower line near the belly, found in the three preceding species, is here wanting; but the anus, as in the others, remote.

The *fins*. The dorsal and anal are situated as in No. CLXXVI.; the pectoral middle, remarkably long, acuminate above, point setacious; the ventral remote, extremely small; the caudal bilobate as in the last species, the upper lobe very short.

The *colour*. The upper part of the head and back a dark blue, brightening on the sides to a bright leaden. The colour of the fins was accidentally omitted.

	Inches.	Lines.
Length of the subject described, from the upper jaw to the caudal fin	10	6
to the dorsal fin	7	0
ventral fin	6	3
point of the maxillary process	3	5
of the lower lobe of the tail	1	9



KUDDERA. C

R

LINAGOW

ELOPS.

GENERIC CHARACTER.

Caput læve. Dentium scabrities in maxillarum margine, palato. Membrana branchiostega radiis XXX.*: præterea exterius in medio armata dentibus quinque.*

The head smooth. The margin of the jaws, and the palate rough with small teeth. Thirty rays in the branchial membrane: armed in the middle externally with five teeth.

No. CLXXIX.

ELOPS *cauda bilobata; squama lanceolata horizontale ante pinnam caudalem, supra et infra.*

The ELOPS with a tail unequally divided; a lanceolate, horizontal scale on each edge of the caudal fin.

Elops saurus Linn. S. N. p. 518.

Called by the Natives JINAGOW.

B. XXX. *D.* $\frac{2}{22}$. *P.* 17. *V.* 14. *A.* $\frac{2}{14}$. *C.* 28.

THE *head* large, ovate, compressed, without scales, splendent; the front gently declivous, with a broad, smooth furrow, striated on the edges from the crown to the nose. The mouth wide, a little oblique, or arched, hardly any lips. The jaws nearly of equal length, long, extractile; the under carinate; the upper has an oblong, rounded, flat process, reverted towards the opercula: both are scabrous externally. Teeth marginal, small, not close, except in the forepart of the lower jaw. Tongue lanceolate, above convex, rough, free. Two denticulate bones on each side of the palate. Eyes supreme, advanced; large, round, and being covered with the transparent skin of the head, look as if enclosed in glass. The nostrils distant from the orbit, double, unequal, contiguous, small, oval. Branchial opercula large, rounded, without scales, splendent; great part of the membrane displayed; the aperture wide, lateral and gular.

The *trunk*. The back very gently arched, a little rounded; the breast and abdomen almost straight, plane; the sides and tail compressed. The denticules of the anterior branchiæ very long. Lateral line bends gently from the upper edge of the opercula, but soon becomes middle and straight. The anus behind the middle.

The *fins*. The dorsal, nearly in the middle, falcate, consisting of six or seven assurgent rays, and fourteen or fifteen declining. The first two or three are spinous, but lie close on each other. The pectoral very low, acuminate at top; the ventral opposite to the dorsal, rather shorter than the pectoral, consisting of fourteen rays, of which the first is longest; the anal very remote, in shape like the dorsal, but much smaller; the caudal fin bifid, the upper lobe longest. At the origin of the caudal fin, on each side, is a large, bony, lanceolate scale.

The *colour*. The upper part of the head and back a darkish blue; the abdomen pearl-white. The dorsal and caudal fins, somewhat less dark than the back; the pectoral of the same colour, but black at the points; the ventral and anal light, with a faint yellowish tinge.

Length of the subject, one foot eight inches.

It sometimes appears at the English tables, but is not esteemed.

REMARKS.

The spinous rays of the dorsal and anal fins lie close on each other, and their points sometimes not piercing the skin (particularly those of the anal fin), may easily pass unnoticed.

MUGIL.

GENERIC CHARACTER.

Labia membranacea: inferius introrsum carinatum. Dentes nulli. Denticulus inflexus supra sinus oris. Membrana branchiostega radiis vii. *curvis; opercula lævia, rotundata. Corpus albicans.*

The lips membranous; the lower lip carinated inwardly; no teeth; a small inflected tooth above the opening of the mouth. The branchial membrane has vii. curve rays. The opercula smooth, rounded. The body inclining to white.

No. CLXXX.

MUGIL *pinna prima dorsali radiis quatuor; cauda lunata.*

The MUGIL with a first dorsal fin of four rays; and a lunated tail.

Mugil Cephalus Linn. S. N. p. 520.

Called by the Natives BONTAH.

B. vi. *D.* $\frac{4}{4}$. 10. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{1}{11}$. *C.* 18.

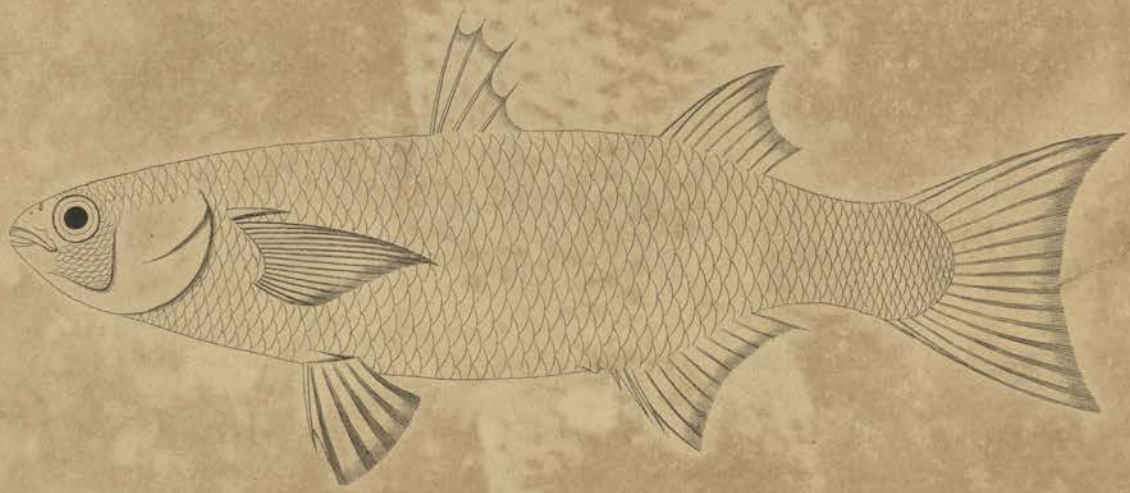
THE *body* oblong, somewhat compressed, smooth, squamous; scales large, ciliate, imbricate, close.

The *head* roundish, compressed, blunt; the crown and front depressed, squamous, smooth; the rest without scales; the rostrum short, obtuse, smooth, projects over the mouth. The mouth very small, with hardly any lips; without teeth. The jaws short, extractile, the under has a carina internally, which is received into a groove in the upper. The tongue thick, fleshy, smooth, fixed. The palate rough. The eyes high, advanced, large, orbicular, prominent. Nostrils double, not contiguous, and situated above a striated lamina, in front of the orbit. Branchial opercula bony, smooth, without scales; the membrane half concealed; the aperture small.

The *trunk*. The back nearly straight, convex; the sides also convex; the abdomen a little arched, not prominent; the tail continues broad and not much rounded; the branchiæ pectinate; the lateral line scarcely discernible, nearly straight; the anus very remote.

LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ASIATIC

BONTAH



KUNNESER

The *fins*. The first dorsal, in the middle of the back, consists of four pretty long, curve, spinous rays; the second, of ten declining ramous rays, is situated an inch and six lines nearer the tail; the pectoral high, broad, acuminate above; the ventral middle between the pectoral and first dorsal, has one spinous ray; the anal opposite, and in shape exactly like the second dorsal, has one spine also; the caudal fin large, broad, lunate.

The *colour* of the crown and back changeable green and blue, the rest a shining white. On each side are five or six dusky fillets, running from the opercula to the caudal fin.

Length, one foot and a half.

REMARKS.

This fish, though very common in India, is much esteemed; being in quality greatly superior to the Gray Mullet in England. They are sometimes considerably larger than the subject now described.

No. CLXXXI.

MUGIL *squama lanceolata ad pinnas pectorales et ventrales; pinna anali aculeis tribus; cauda sub-lunata.*

The MUGIL with a lanceolate scale at the pectoral and ventral fins; three spines in the anal fin; the tail sub-lunate.

Called by the Natives KUNNESEE.

$B.$ v. $D.\frac{4}{4}.9.$ $P.$ 14. $V.\frac{1}{6}.$ $A.\frac{3}{12}.$ $C.$ 18.

THE *body* oblong, thickish, compressed, squamous, smooth. Scales sub-orbicular, truncate at the base, not tenacious.

The *head* ovate, roundish, compressed; the crown and front depressed; the nose short, soft, obtuse, but does not project so far over the mouth as in the last fish; the crown and cheeks squamous. The mouth small, without teeth; lips simple. Jaws short, extractile; the under somewhat shorter than the upper; the former carinate, and the latter grooved as in the Mullet. Tongue thickish, smooth, fixed. Palate tuberculate. The eyes high, advanced, large, orbicular. Nostrils high, double, the posterior oval. The branchial opercula rounded, bony, without scales, smooth; the membrane covered; aperture arched.

The *trunk*. The back straight to the second dorsal fin, it then declines more sensibly than in the Mullet; the breast and abdomen convex; the exterior branchiæ pectinate; no lateral line visible. Anus remote.

The *fins*. The dorsal fins as in the Mullet, but the posterior more falcate; the pectoral middle, acuminate; the ventral decline from the second ray; the anal longer than the dorsal, exactly opposite, sub-falcate; the caudal sub-lunate.

The *colour* of the head and back, grayish; the face, sides, belly, and throat, white; the dorsal and caudal fins a dark gray; the others whitish.

REMARKS.

This fish, at first sight, is easily mistaken for a young Mullet; in what it will be found to differ may be comprised in the few following distinctions. The nose is less prominent; the cheeks are squamous; the branchial membrane has five ossicles; the lanceolate squamæ at the pectoral and ventral fins, and the three spines in the anal fin, are wanting in the Mullet.

No. CLXXXII.

MUGIL *spinis analibus nullis; capite toto squamoso; squamis magnis ciliatis; cauda lunata.*

The MUGIL without spines in the anal fin; the head intirely squamous; scales very large and ciliate; the tail lunate.

Called by the Natives PEDDARAKI SOVERE.

B. v. *D.* $\frac{4}{4}$. 9. *P.* 19. *V.* $\frac{1}{6}$. *A.* 12. *C.* 18.

THIS fish differs from the Mullet in the shape of the body, as well as from the Kunnesee, while it agrees with both in many of the principal characters. The scales every where sub-ovate, ciliate, remarkably large, tenacious.

The *head* is less of an ovate shape, and, as well as the opercula, covered with scales. The upper lip is thickish, and the tongue roughish; but the mouth, jaws, palate, nostrils, branchial opercula, membrane, and aperture, are exactly as described in the last species. The eyes are of the same form, though placed lower.

The *trunk.* The back is more assurgent and arched, and the abdomen a little more prominent, than in the last; the sides and tail convex, compressed. The denticles of the branchiæ short and soft. The lateral line can scarcely be traced. The anus remote.

The *fins.* The first dorsal, of four spinous rays, is in the middle of the back where it begins to decline towards the tail, and of the same shape as in the last, but not so high; the second dorsal is much more falcate, and the two first rays longer, more setaceous; the pectoral fin middle, and also more falcate; the ventral as in the last, opposite to the dorsal, but the lanceolate squamæ are entirely wanting; the anal, in shape like the second dorsal, has no spinous rays; the caudal large, and lunate.

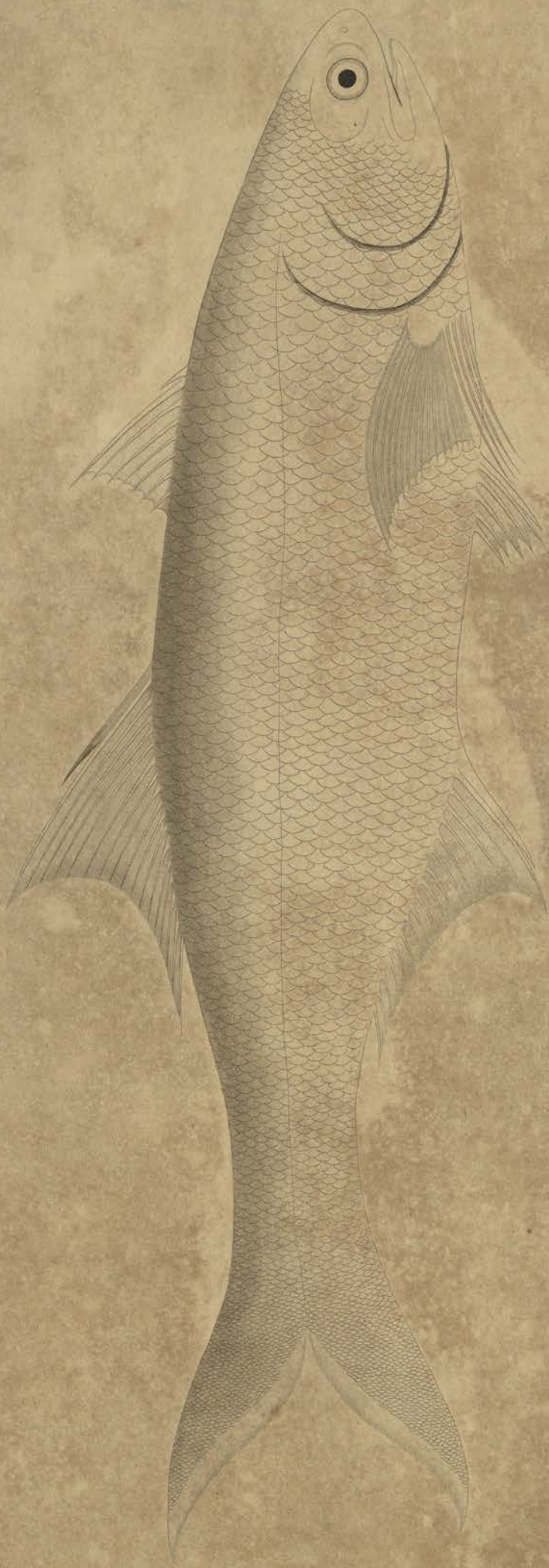
The *colour* nearly that of the Mullet; and a few darkish fillets are visible also on the sides, though less conspicuous.

Length of the subject described, two feet.

REMARKS.

In this and the preceding species, as well as in the Mullet, the continuation of the membrane of the dorsal fin, gives the idea in the drawing of a fifth ray; nevertheless, all my memoranda concur in the number four spinous rays.

PEDDARAKI SOVERE



MAGA JELLEE

POLYNEMUS.

GENERIC CHARACTER.

Caput compressum undique squamosum: rostro obtusissimo, prominente. Membrana branchiostega radiis vii. *seu* v. *Corpus digitis liberis ad pinnas pectorales.*

The head compressed, and all over squamous: the rostrum prominent, and very obtuse. Seven or five rays in the branchial membrane; free digiti at the pectoral fins.

No. CLXXXIII.

POLYNEMUS *digitis quatuor brevioribus; pinna caudali bifida, sub-falcata, squamosa.*

The POLYNEMUS with four shorter digiti; a bifid caudal fin, slightly falcate and covered with scales.

Called by the Natives MAGA JELLEE.

B. vii. *D.* $\frac{8}{8}$. $\frac{1}{15}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{1}{17}$. *C.* 22?

The *body* oblong, thick, compressed, squamous, a little rough to the finger; scales middle size, orbicular, ciliate, not tenacious.

The *head* large, gently declivous, squamous excepting the nose, compressed, the front flattish, rostrum obtuse, projecting. Mouth under the rostrum, transverse, rather wide, no lips. The jaws extractile, the under shortest, both rough like a file externally and internally, but no large teeth. Tongue oblong, point round, smooth, the rest scabrous. The palate smooth in the middle, rough on the sides. Eyes advanced, nearly middle, large, round. Nostrils double, nearer the rostrum than the orbit. The opercula rounded, squamous, margins ciliate; the membrane covered; the aperture lateral and gular.

The *trunk*. The back arched, convex; the breast and abdomen straight, plane; the sides and tail compressed, the latter somewhat carinate. The exterior branchiæ pectinate, the others rough, like the maxillæ. The lateral line, from the edge of the opercula declines very gradually, afterwards middle and straight. The anus nearly middle.

The *fins*. There are two dorsal: the first scapular, of eight spinous rays, the first ray very short, the others extend above the membrane; the second fin in the middle of the back, has one spinous ray, and sixteen ramous in a crescent form; the pectoral extremely low, broad, acuminate above; the ventral contiguous, shorter than the pectoral; the anal exactly like the second dorsal, but rises a little nearer the tail; the caudal very squamous to the edge, rendering it difficult to count the rays, deeply divided, the lobes thick and slightly falcate towards the points. The longest of the four digiti, about two inches two lines; all are of a whitish colour.

The *colour* of the head above, and of the back, a dusky blue; the parts below the eyes and the lateral line, gray; the lips reddish; and there is a yellow, lunate spot behind the orbit. The dorsal and caudal fins dusky, not black; the other fins glossy, light colour.

Length of the subject described, one foot eight inches.

No. CLXXXIV.

POLYNEMUS *cauda longissima, falcata, lobis squamosis, setiferis; opercula serrato; digitis quinque, primo prope anum extenso, ceteris gradatim decrescentibus.*

The POLYNEMUS with a very long, falcate, tail, the lobes squamous, setiferous; a serrated operculum; five digiti, of which the longest reaches nearly to the anus, the others gradually decreasing in length.

Called by the Natives MAGA BOOSHEE.

B. vii. *D.* $\frac{8}{8}$. $\frac{1}{15}$. *P.* 17. *V.* $\frac{1}{6}$. *A.* $\frac{2}{2}$. $\frac{1}{14}$. *C.* 20.

THE *body* of this species differs in shape from the former. It is narrower at the waist or middle; the back rises towards the second dorsal fin, as the abdomen does towards the anal, and both fins are situated nearly opposite, where the body narrows towards the tail, which is more attenuated and rounder than in the last fish. The roots of both fins are covered with scales, and the caudal fin completely squamous.

The *head* is rather longer, narrower, intirely squamous; the rostrum obtuse, but smaller, and more prominent; the mouth, jaws, tongue, palate, eyes, and nostrils, as described in the last. The branchial opercula two-leaved; the first angular, serrated; the posterior oval, smooth: both are squamous; the membrane apparent; the aperture large.

The *trunk*. The abdomen straight but convex, the tail smaller than in the former. The first half of the lateral line more declivous, the after part straight. The anus nearly middle.

The *fins*. The first dorsal consists of one short spine and seven declining spinous rays: the points of which extend above the membrane; the second dorsal is more distant from the first, but of the crescent-form; the pectoral low, acuminate above; the ventral as in the former; between the anus and anal fin, there are two small spines connected by a membrane; the anal commences opposite to the middle of the dorsal, its spinous ray lying close on the ray next it; the caudal deeply divided, falcate, each lobe terminating in a setaceous thread an inch and a half in length; the body of the fin, as already mentioned, intirely covered with small scales. The length of the longest digitus at the pectoral fin, measured above four inches.

The *colour* of the head and back, a dusky blue, or lead; the sides and belly light gray, and as if sprinkled with black sand. The lips and rostrum reddish; the digiti, which in the last species were whitish, are here orange. The dorsal and caudal fins, dark; the lower part of the caudal, as also the pectoral, almost black; the ventral and anal fins, light colour.

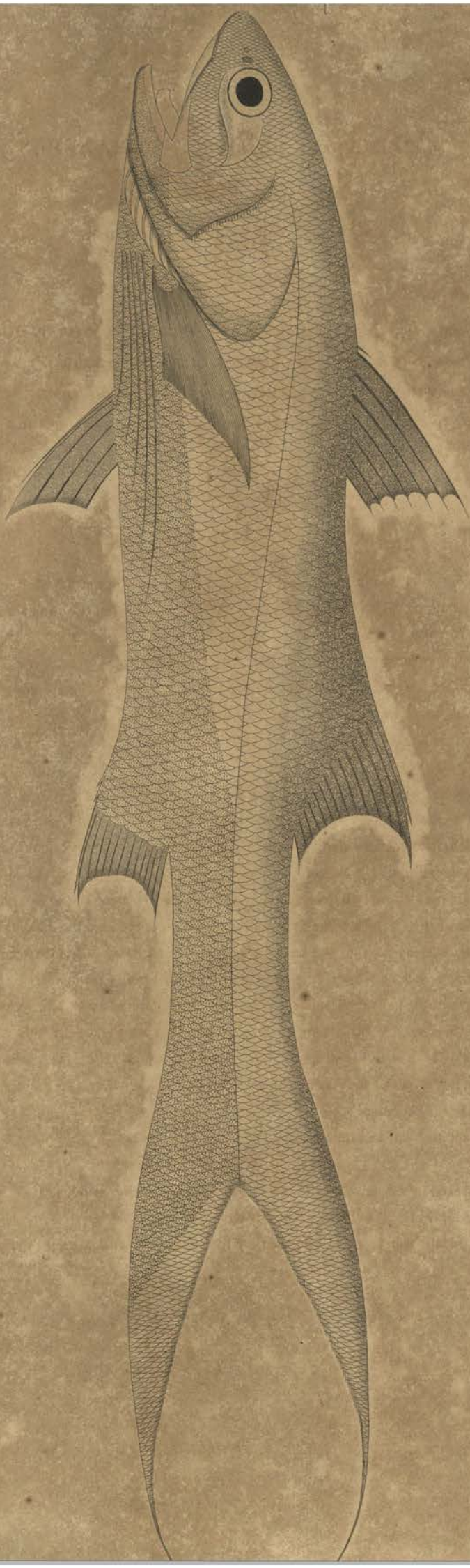
Length of the subject, one foot four inches.

REMARKS.

It may be remarked in this as well as in the former species, that the spinous rays of the dorsal and anal fins, lie so close on the next rays as to shew the points only.

Both fishes, especially the first, are esteemed for the table, and are known to the English under the name of Rowball.

CLXXXIV.



MAGA BOOSHEE

R

CLXXXV.

TUPSEE MUTCHEY

No. CLXXXV.

POLYNEMUS *digitis septem, primus duplo quam ipsum corpus longior, ceteris sensim brevioribus; cauda biloba, falcata.*

The POLYNEMUS with seven digiti; the first twice the length of the body, the others gradually shortening. The tail bilobed and falcate.

Polynemus paradiseus Lin. S. N. p. 522.

Called by the Natives TUPSEE MUTCHEY.

English MANGO FISH.

B. . *D.* $\frac{7}{7}$.—17. *P.* 16. *V.* 6. *A.* 12. *C.* 18.

WITH a strong similitude in the form of the head, the rostrum, the mouth, and disposition of the fins, the general figure of this fish is more elegant than either of the two preceding species. The lateral line bends more gracefully, the attenuation of the tail is more gradual, and the caudal fin is not, as in the others, covered with scales.

The number and length of the digiti furnish a sufficient specific character; besides which, the scales are smaller, the pectoral and ventral fins acuminated at the middle, not at top, and the form of the caudal fin is more neat.

	Inches.	Lines.
The *length* from the rostrum to the caudal fin - - -	6	4
of caudal fin - - - - - -	2	3
of first digit - - - - - - -	15	0
of second - - - - - -	12	0
of seventh - - - - - - -	3	3

REMARKS.

The Mango fish is reckoned by much the most delicate of any found at Calcutta. It is in season five or six months in the year, and chiefly at the same time with the Mango fruit; from which, and a resemblance in colour to that fruit, it probably owes its English name.

It is not found at Vizagapatam where the Rowball is not rare. The figure now presented was taken from a specimen in spirits received when in India from Bengal, and in good preservation, the colour excepted. A paper containing a more complete description made at the time has been lost.

CLUPEA.

GENERIC CHARACTER.

Caput: maxillarum superiorum mystacibus serratis.

Membrana branchiostega radiis viii. *branchiæ interne setaceæ.*

Corpus: abdominis carina serrata; pinnæ ventrales sæpe novem radiatæ.

The head: the mystaces of the upper jaw serrated.

Eight rays in the branchial membrane; the branchiæ setaceous internally.

The body: the carina of the abdomen serrated; the ventral fins have frequently nine rays.

No. CLXXXVI.

CLUPEA *corpore oblongo-ovale; maxillis sub-equalibus, inferiore truncata; pinna dorsalis radiis novemdecem.*

The CLUPEA with an oblong-oval body; the maxillæ nearly of equal length, the under truncate; nineteen rays in the dorsal fin.

Harengus minor indicus Willough. Ichth. App. Tab. 1. *f.* 2.

Called by the Natives KOWAL or KOWARLOO.

B. v. *D.* 19. *P.* 15. *V.* 8. *A.* 20. *C.* 22.

THE *body* oblong-oval, compressed, squamous; scales large, orbicular, deciduous.

The *head* small, compressed, naked; the front gently declivous, depressed, slightly striate. The mouth small, rather oblique, without lips; the jaws nearly of equal length; extractile, the upper emarginate, the under carinate, truncate, and covered by the upper. No teeth perceptible. Tongue small, acute, smooth, free. Palate narrow, not rough. Eyes middle, round, iris silvery. Nostrils double, in a shallow groove near the rostrum. The branchial opercula consist of three laminæ; the two anterior rounded, the posterior roundish, but curve, both without scales: the membrane has five rays only; the aperture large, of a form somewhat triangular.

The *trunk.* The back gently arched, a little convex; the sides and tail compressed; the breast and abdomen thin, carinate, and serrated. The branchiæ consist of four leaves, three pectinate, the setaceous denticules of the first very long. The lateral line supreme, hardly visible. The anus remote.

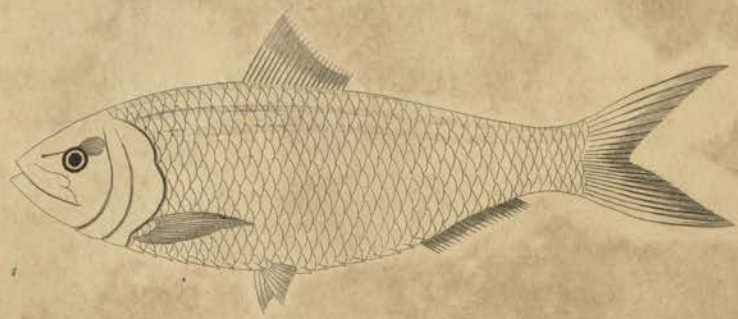
The *fins.* The dorsal solitary, in the middle of the back, has nineteen declining rays soft and slender; the pectoral low, acuminate above; the ventral opposite to the dorsal, very short; the anal rays a little assurgent, but nearly equal; the caudal fin deeply bifid.

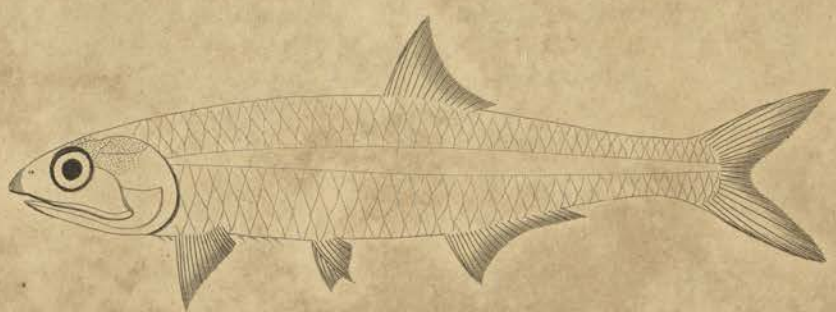
The *colour* of the crown and back changeable green and blue; the face and opercula, silvery; the sides lighter than the back, the belly white. The dorsal and caudal fins have a greenish cast, the latter striped black, the other fins light, or whitish.

The *length* of the subject to the caudal fin four inches four lines.

Five inches and a half is the size of the largest.

LIBRARY ROYAL BOMBAY ASIATIC SOCIETY





OWAL

NATTOO

R

REMARKS.

This fish when fresh, if not superior, is at least in quality equal to the best Scotch herring: though in size much smaller. They begin to make their appearance at Vizagapatam in March, and are abundant through the summer months. The natives cure them in the manner of Sardinias: or sometimes in red earth mixed with salt.

The name given to my drawing by the fishermen at Madras was Kanwali. Bloch received a specimen from Tranquebar under the name Poykia, or Nanalai. His figure of the Clupea Sinensis, however differs from the present figure, as well as from that in Willoughby's Appendix.

No. CLXXXVII.

CLUPEA *corpore lanceolato; linea laterali recta, media, argentea; rostro prominente, obtuso.*

The CLUPEA with a lanceolate body, the lateral line straight, middle and silvery. A prominent, blunt, nose.

Clupea Atherinoides? Linn. S. N. p. 523.

Called by the Natives NATTOO or NETTOOLI.

B. xii. *D.* 15. *P.* 16. *V.* 7. *A.* 20. *C.* 22.

THE *body* lanceolate, compressed, squamous, pellucid; scales large, smooth, tenacious.

The *head* compressed, without scales, the front depressed, rostrum projecting, obtuse. The mouth low, less oblique than in the last, large, no lips; jaws extractile, the under shortest, the edge of the upper serrated: both filled with numerous, close, acerose, teeth; tongue very short, rough; the palate also denticulate. Eyes middle, round, large; nostrils double, close to the rostrum. The branchial opercula bi-laminate, rounded; the membrane covered; the aperture arched.

The *trunk.* The back less arched than in the last, but a little convex, the sides compressed; the abdomen carinate, straight, and serrated. Branchiæ as in the last; the lateral line consists of a broad silver fillet, middle, straight. The anus nearly middle.

The *fins.* The dorsal a little behind the middle, of a shape slightly falcate; pectoral unusually low, acuminate above, short; the ventral shorter by half, but of the same shape, has seven rays: the anal rises nearly opposite to where the dorsal ends, and is similar to it in shape, but lower; the caudal fin bifid.

The *colour* universally a yellowish-white.

Length, five inches.

REMARKS.

This fish rarely exceeds five inches in length. When about three inches they often, with the Sorings (No. CXIII.) of the same or smaller size, are brought to table on shewers dressed in the manner of Inkle-fish. The fry of other fish sometimes intermixed with them are greatly inferior to the Nattoo, which rivals the English white-bait.

No. CLXXXVIII.

CLUPEA *pinna dorsali radiis quindecem, anali radiis quadraginta.*

The CLUPEA with fifteen rays in the dorsal fin, and forty rays in the anal.

Called by the Natives DITCHELEE.

B. v. *D.* 15. *P.* 15. *V.* 7. *A.* 40. *C.* 20.

THE *body*. This species in its shape differs from the herring; the back is more straight, and the hinder part of the tail rises more obliquely towards the caudal fin.

The *head* naked, compressed, the crown and front grooved, rostrum short. The mouth oblique, without teeth; the exterior hinder part of the upper jaw serrated, the lower jaw short and carinate, covered by the upper when the mouth is shut. The tongue, palate, opercula, branchial membrane, and aperture, as described in the Kowal: but the eyes here are larger, and the nostrils closer to the edge of the rostrum.

The *trunk*. The branchiæ, lateral line, and anus, differ inconsiderably from the Kowal.

The *fins*. The position and shape of the fins also as described in the Kowal: only that the pectoral are rather higher, and the anal much longer than in that fish.

The *colour*. The upper part of the head and trunk changeable green; the rest silvery; the belly of a pearl colour.

Length of the subject six inches.

No. CLXXXIX.

CLUPEA *maxilla superiore retro-elongata in processum acutum, denticulatum; operculo posteriore maculato, acuminato; squama lanceolata supra pinnas pectorales et ventrales.*

The CLUPEA with a retroflex process from the upper maxilla, denticulated, and sharp-pointed; the hinder operculum acuminate and marked with a black spot; a lanceolate scale above the pectoral and ventral fins.

Called by the Natives POORAWAH.

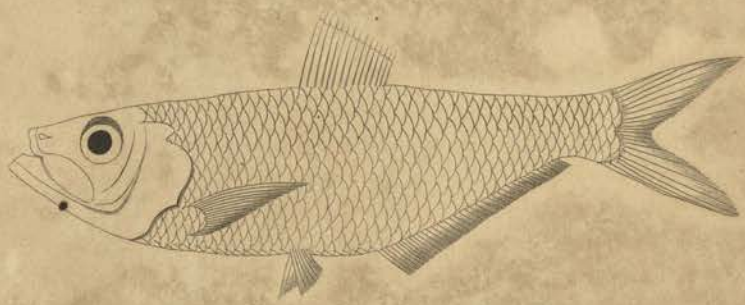
B. xii. *D.* $\frac{1}{14}$. *P.* 14. *V.* 7. *A.* 35. *C.* 18.

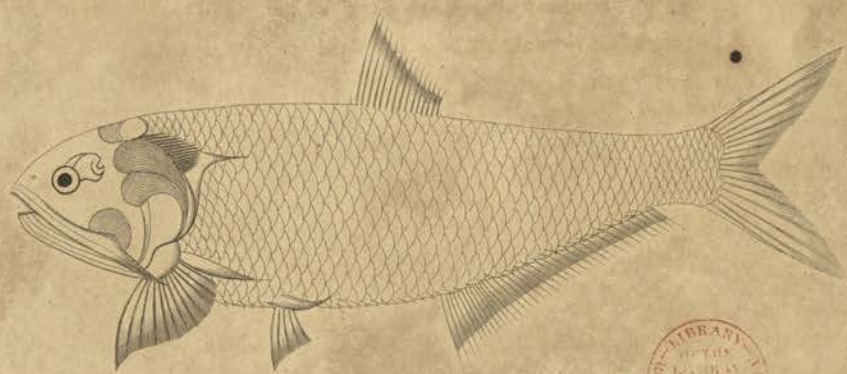
THE *body* oblong, compressed, covered with large loose scales. The back straight, convex; the sides more convex than in the herring, and the belly more prominent, but thin, carinate, and prickly.

The *head* without scales, compressed, declivous, front depressed, grooved. Mouth oblique, very wide, the lower jaw shortest, and truncate, the upper has a long reflex, serrated process, reaching to the pectoral fin: both jaws have numerous small teeth. The tongue and palate rough. The eyes middle, small, round, iris golden. Nostrils nearer the rostrum than the orbit. The branchial opercula striate, gilded, with a black spot on the pointed margin. The membrane has twelve rays; the aperture wide.

The *trunk*. The branchiæ as already described; the lateral line, as far as could be discerned, straight; anus remote.

The *fins*. The dorsal nearly in the middle, has a small short spine in front of thirteen descending rays; the



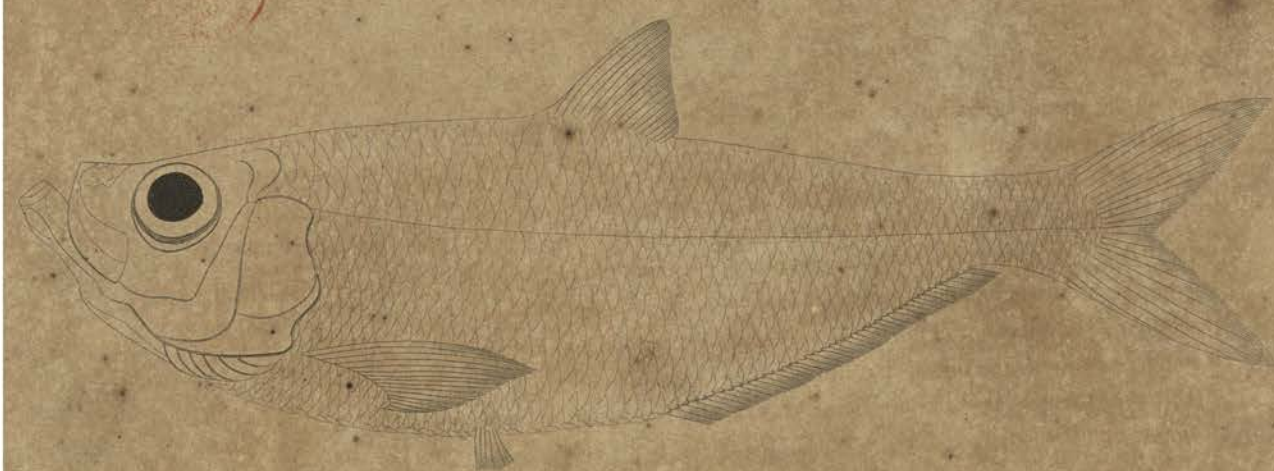


LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

DITCHELEE

POORAWAH

PEDDAH POORAWAH



JANGARLOO

pectoral very low, with a large lanceolate squama at its rise; the ventral has one similar, but smaller, and seven rays; the anal has thirty-five; the caudal bifid, with eighteen rays.

The *colour* a dark bluish green on the upper parts; the sides and belly pearly. The opercula, as before mentioned, appear as if gilded, and have a black spot on the margin. The dorsal, anal, and caudal fins have a yellowish cast, the ossicles black; the pectoral and ventral whitish.

Length of the subject eight inches.

No. CXC.

CLUPEA *maxillâ superiore retro-elongata in processum denticulatum; operculo mutico; macula et squamis lanceolatis carens.*

The CLUPEA with a retroflex denticulate process from the upper jaw; the operculum not acuminate; and without the spot and lanceolate squamæ.

Called by the Natives PEDDAH POORAWAH.

B. xii. *D.* $\frac{1}{13}$. *P.* 14. *V.* 6. *A.* 46. *C.* 20.

THOUGH this species agrees with the last in the reverted maxillary process, it differs greatly in other respects.

The *body* is more arched, and the tail has a bend downwards; the lateral line conspicuous, and very slightly curve; the abdomen not serrated.

The *head* small, the front almost horizontal; the mouth extremely oblique; the under jaw shorter than the upper, but not truncate. The teeth, tongue, palate, eyes, and nostrils, as in the former; the opercula also golden, but not striate, and there is no black spot.

The *fins*. The disposition of the fins as in the last; the pectoral low, and the ventral in the middle between it and the dorsal; but the lanceolate scale is wanting in both.

The *colour* the same as in the last species, only that the ossicles of the fins are not black.

Length eight inches.

No. CXCI.

CLUPEA *corpore oblongo; ore simo, oculis magnis; linea laterali sub-curva deorsum.*

The CLUPEA with an oblong body; a flat mouth; large eyes; the lateral line somewhat bent downwards.

Called by the Natives JANGARLOO.

B. vi. *D.* 17. *P.* 17. *V.* 6. *A.* 43. *C.* 22.

IN the form of the body and disposition of the fins, as well as in other characters, this species agrees with the last described. It differs in the following: the lower jaw is thicker, shorter and truncate; the upper has no reverted process; the branchial membrane has six rays only; the eyes are much larger; and the lateral line, instead of being arched, bends a little downwards.

The *fins* are nearly of the same shape as in the last species; but the first ray of the pectoral is a remarkable flat, broad, ossicle, with a ramous point; and the ramous rays of the fins are more unequal in length. The caudal fin bifid, as usual.

The *colour* of the head changeable, gold, green, and blue; the rest, of the same colour as the common herring: all the fins have a yellowish cast, the dorsal and pectoral slightly tipped with black.

Length eleven inches.

No. CXCII.

CLUPEA *ore simo; maxilla inferiore truncata; abdomine prominulo, carinato, serrato; pinnis ventralibus exiguis.*

The CLUPEA with a flat mouth, the lower jaw truncate; the belly a little prominent, carinate, serrated; very small ventral fins.

Called by the Natives DITCHOEE.

B. vi. *D.* 17. *P.* 18. *V.* 7. *A.* 37. *C.* 18.

THIS species differs principally from the last, in the belly being more prominent, and the back a little more arched, consequently it is much broader at the shoulders; the scales bigger and broader; the nostrils single; the ventral fins extremely small; the anal squamous at the root, and following the form of the body rises more obliquely to the tail; the lateral line is perfectly straight.

In the other characters there is little variation.

The *colour* of the crown and back, changeable green and blue, with less golden than in the last; the sides and belly pearly. Fins as in the herring.

Length seven inches.

REMARKS.

It is a much inferior fish for the table, to the Kowal, No. CLXXXVI. and not nearly so abundant.

This species agrees in some respects with the Clupea Sima of Linneus.

No. CXCIII.

CLUPEA *corpore oblongo-ovato; lineis lateralibus duabus; pinnis ventralibus nullis.*

The CLUPEA with an oblong-ovate body; two lateral lines; no ventral fins.

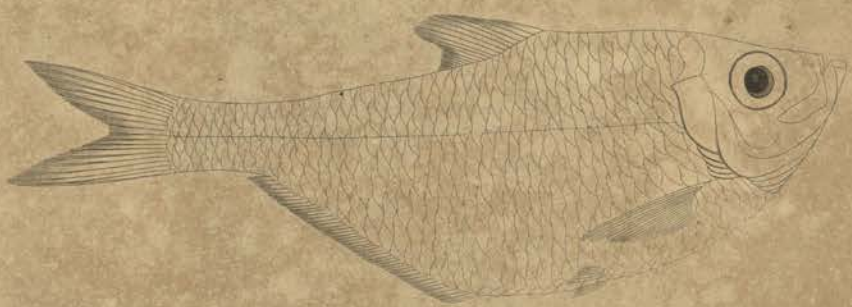
Called by the Natives TARTOORE.

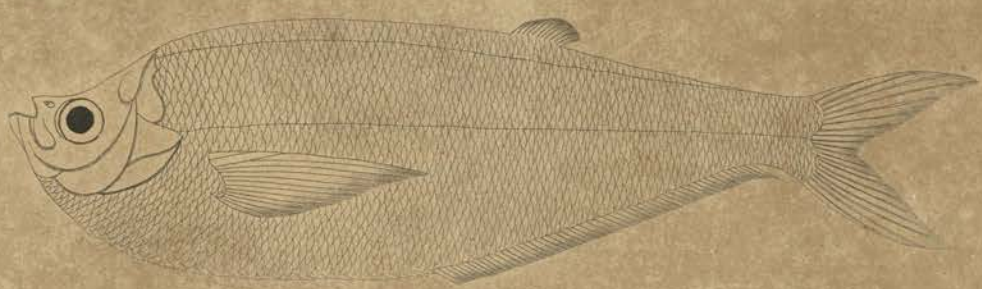
B. ii. *D.* 12. *P.* 13. *V.* 0. *A.* 53. *C.* 20.

THIS species, agreeing in shape of the head, rostrum, jaws, &c. with the three preceding species, is sufficiently distinguished from them by the two lateral lines, the want of ventral fins, and two branchial rays only.

The *body* approaches nearer an oblong-ovate form; and besides the lateral line (which is straight and nearly middle) there is a second parallel, shorter line, near the ridge of the back. The scales are smaller, more compact, especially on the sides, and less deciduous than usual in this genus. The anus middle.

The *fins*. The dorsal remote from the head, and very small; the pectoral nearly middle, longer than the head, acuminate above, and have a flat, long, ramous ossicle, as in No. CXCI; the anal rising near the middle, is continued to within four lines of the tail, being all along of equal height. The caudal fin bifid.





DITCHOEE.

TARTOORE.

POORWA

The *colour* very different from that of the herring; the upper parts being of a yellowish-white, the rest silvery. The fins glassy, with a yellowish tinge.

Length six inches and a half.

REMARKS.

This species in the want of ventral fins, and in having two rays only in the branchial membrane, agrees with the Clupea Sternicula of Linneus, but by no means with the Gasteropelicus described by Gronovius to which reference is made, Linn. S. N. p. 524.

It may be further remarked, that both the Sima and Sternicla of Linneus are omitted by Gmelin.

No. CXCIV.

CLUPEA *corpore oblongo; pinna anali radiis quadraginta; macula ad marginem superiorem operculi.*

The CLUPEA with with an oblong body; an anal fin of forty rays; and a spot at the upper edge of the operculum.

Called by the Natives POORWA.

B. . *D.* 13. *P.* 13. *V.* 7. *A.* 40. *C.* 20.

THE *body* oblong, scales large, deciduous.

The *head* large, compressed; the front declivous, grooved, rostrum obtuse. Mouth oblique; jaws rough like a file. Eyes middle, large, iris silvery. Opercula smooth, the posterior lamina acuminate, above which on the lateral line is a roundish dark spot.

The *trunk* comes nearest in form to No. CLXXXIX. a fish bearing nearly the same name; but there is no reverted, serrated, maxillary process; no prickle before the dorsal fin; and the large squamæ at the pectoral and ventral fins are wanting. The abdomen is straighter, and the lateral line more conspicuous.

The *fins*. The dorsal, ventral and anal fins as in No. CLXXXIX.; the pectoral acuminate in the middle; the caudal fin bifid.

The *colour*. My memoranda here defective, as also in respect to the branchial membrane.

Length seven inches and a half.

No. CXCV.

CLUPEA *corpore ovato; maculis parvis obscuris, in serie, supra lineam lateralem.*

The CLUPEA with an ovate body; and a row of small, obscure spots, above the lateral line.

Called by the Natives KEELEE.

B. v. *D.* 15. *P.* 15. *V.* 8. *A.* 18. *C.* 20.

THIS species differing in its exterior shape, and somewhat in the colour, from the Kowal, No. CLXXXVI. agrees nearly in other respects with the description given of that fish.

The *body* is broader, shorter, more ovate; the eyes larger; the nostrils not in a groove; the lateral line supreme, and (as in the Kowal) hardly discernible.

The *fins*. The position and shape of the fins are the same in both, the dorsal only higher, thicker, and more falcate.

The *colour*. The upper part of the head and back greenish, less changeable than in the Kowal; the face and sides bright silver; the belly pearl-white. The fins glassy; the dorsal, anal, and caudal of a light greenish cast.

The *length* six inches; but they grow to eight or ten.

REMARKS.

With the smell and flavour of the herring, they are much inferior to the Kowal. They are les abundant, and less in request. The spots have some resemblance to the Clupea Alosa; but that fish has eight branchial rays, and differs in several other respects.

No. CXCVI.

CLUPEA *corpore ovato; radio postremo pinnæ dorsi longissimo, setaceo.*

The Clupea with an ovate body; the hinder ray of the dorsal fin very long, and setaceous.

Clupea Thrissa Linn. S. N. p. 524.

Bloch. Pl. 404.

Called by the Natives KOME.

B. v. *D.* 16. *P.* 16. *V.* 9. *A.* 25. *C.* 24.

THE *body* ovate, compressed; scales somewhat orbicular, imbricate, deciduous.

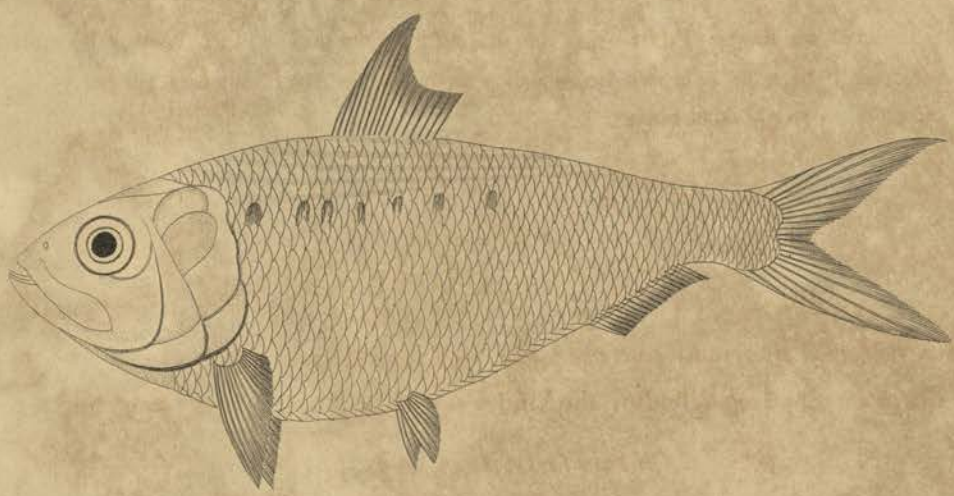
The *head* small, declivous, compressed, without scales; the front smooth, rostrum obtuse, projecting over the mouth. Mouth nearly transverse, small; jaws hardly extractile, without teeth; no lips. Tongue very small, smooth, fixed; the anterior part of the palate slightly tuberculate. Eyes middle, orbicular; iris pearl-colour; nostril in the middle between the orbit and the rostrum, divided by a valve. The branchial opercula seemingly three-leaved, the posterior somewhat shield-form, smooth, splendent; the membrane easily discovered; the aperture large, somewhat angular.

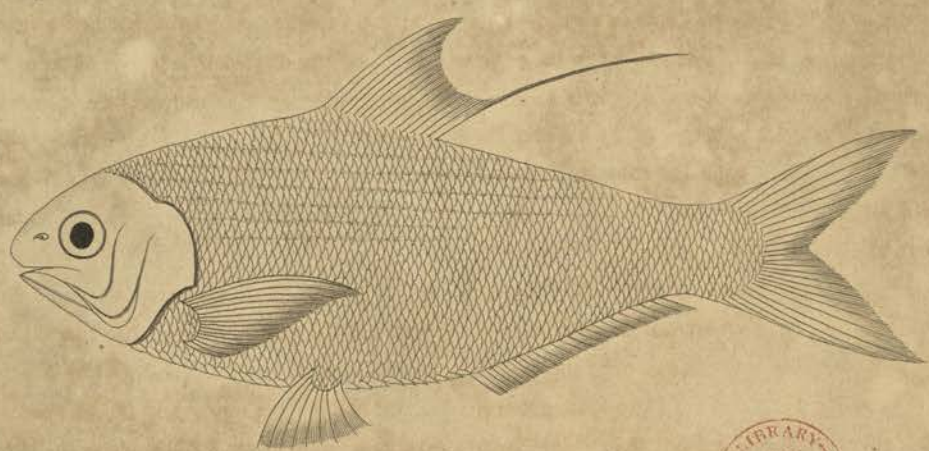
The *trunk*. The back arched, at first carinate, afterwards a little convex; the breast and abdomen carina-serrated; the sides and tail compressed. The denticles of the exterior branchiæ very long. Lateral line middle, straight. The anus remote.

The *fins*. The dorsal middle, a little falcate, the last ray setaceous, reaching to the tail; the pectoral low, nearly as long as the head, acuminate above; the ventral half as long as the pectoral, opposite to the beginning of the dorsal; the anal consists of twenty five rays, nearly of equal length; the caudal fin bifid.

The *colour*. The crown of the head greenish, the rest white; the upper part of the opercula gilded; the back changeable, less brilliant than in the Kowal; several dusky horizontal fillets above the lateral line hardly visible when the fish is dead; the sides of a pearl-colour mixed with gold, changeable; the abdomen white; the dorsal and caudal fins have a yellowish tinge.

Length seven inches.



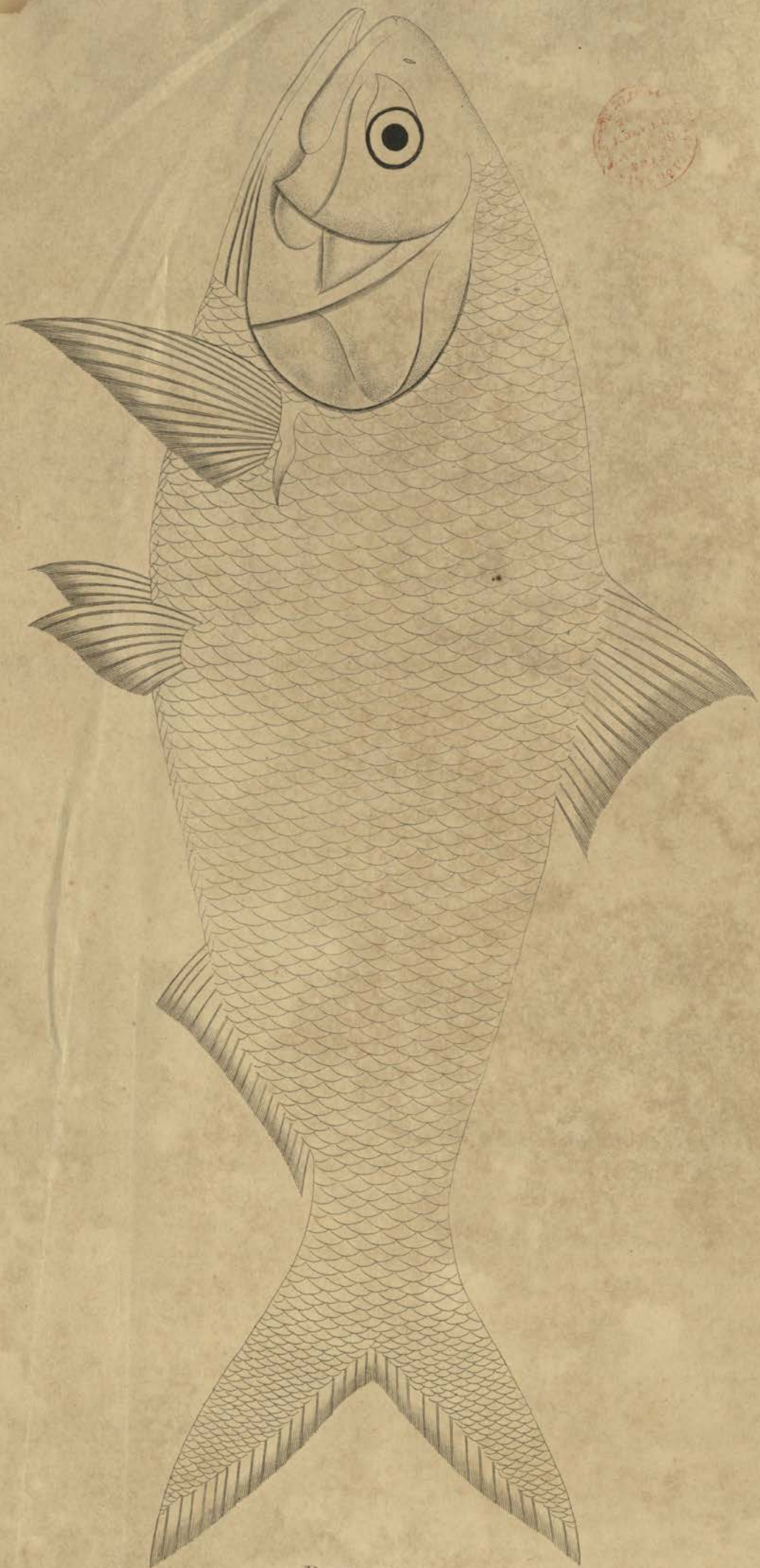


LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

KEELEE

KOME

PEDDA KOME



PALASAH

No. CXCVII.

CLUPEA *corpore ovato; radio postremo pinnæ dorsi setaceo, longo: ossiculis membranæ branchialis latissimis.*

The CLUPEA with an ovate body; the last ray of the dorsal fin long and setaceous; the ossicles of the branchial membrane remarkably broad.

Clupea Nasus, Bloch. Pl. 429.

Called by the Natives PEDDA KOME.

B. v. *D.* 16. *P.* 15. *V.* 8. *A.* 22. *C.* 24.

THIS, with a strong resemblance to the last, is held by the fishermen to be a distinct fish. The rays of the branchial membrane remarkably broad; the nostrils distant from each other; the anal fin more falcate; eight rays only in the ventral; and the lateral line more obscure. These variations appeared to be constant: in other respects, the description of the last fish may serve equally for the present.

Length, nine inches six lines.

Neither of them are common at Vizagapatam.

No. CXCVIII.

CLUPEA *corpore ovato; pinna caudæ squamosa; squama longa, acuminata, ad pinnas pectorales.*

The CLUPEA with an ovate body; the caudal fin squamous; a long pointed scale at the pectoral fins.

Called by the Natives PALASAH.

B. vi. *D.* 18. *P.* 15. *V.* 9. *A.* 20. *C.* 28.

THE *body* broader, rounder, and thicker than usual in this genus; but the breast and abdomen carinate and serrate. The scales large, loose, and singularly extended on the anal and caudal fin.

The *head* large, without scales, compressed, and, when the mouth is shut, obtuse; the front declivous, depressed; the rostrum blunt. The mouth a little oblique, lips thin; the jaws equal, the upper, as usual, covers the under, but has a dent at the point for the reception of a small protuberance on the lower jaw: both are without teeth. The tongue and palate smooth. The branchial opercula large, round, without scales, splendent; the membrane has six ossicles. The branchial denticles setaceous. No visible lateral line. The anus remote.

The *fins*. The dorsal middle, of eighteen declining rays; the pectoral low, with a long, curve pointed squama at the root, consists of fifteen rays, acuminate, slightly falcate, and three inches long; the ventral opposite to the middle of the dorsal, acuminate above, has nine rays almost one half shorter; the anal remote, with twenty declining, short rays; the caudal fin bifid, and very remarkably squamous.

The *colour*. The crown a dark green, the face and opercula splendent white; the back changeable blue,

green, and yellow; the breast, sides and belly, like mother-of-pearl. The dorsal and part of the caudal fin above the scales, darkish, the other fins light, whitish.

	Feet.	Inches.	Lines.
Length from the rostrum to the tail - - - -	1	6	0
the tail - - -	0	2	7
to the dorsal fin - - -	0	5	0
to the pectoral fin - - -	0	3	6
Height from the abdomen to the ridge of the back - -	0	4	8

REMARKS.

This fish is known at Calcutta under the name of Sable fish, and highly esteemed. At Vizagapatam it had passed unnoticed, like many others left to the lower ranks of the people. On its appearance, by my request, in the way of experiment at my brother's table, it was recognised by him as a Bengal acquaintance; and allowed by all to be a rich and luscious fish, with much of the herring flavour.

On questioning the fishermen why it had never been brought before to the Chief's table, they replied, "It was "not a gentleman's fish; the multitude of small troublesome bones utterly disqualifying it." I found it however well known to the Portuguese race, who used it souced, or prepared with tamarinds.

In some respects it resembles the Shad, or Clupea Alosa, but differs in shape, has no spots, and the branchial membrane has only six ossicles.

No. CXCIX.

CLUPEA *corpore elongato, cultrato, alepidoto; pinna dorsi remota, ventrali exigua.*

The CLUPEA with an elongate, knife-form body, without scales; the dorsal fin near the tail, and the ventral extremely small.

Clupea Dorab? Forskal. No. 108.

Called by the Natives WAHLAH.

B. viii. *D.* 16. *P.* 14. *V.* 6. *A.* 31. *C.* 23.

The *body* long, straight, knife-form, compressed, smooth, without scales.

The *head* small, compressed; the rostrum hardly declining; the front depressed, with a small ridge in the middle. The mouth large, very oblique, without lips. The under jaw longest, carinate, and when received into the upper, makes the rostrum appear pointed. In the upper jaw, are four long, projecting, lanceolate, teeth, with many smaller marginal behind; in the under jaw they are long, distant, reflex. Tongue small, ovate, smooth, loose; palate also smooth. Eyes supreme, moderate size; nostrils oval, divided by a valve. The branchial opercula two-leaved, with the appearance of a third, smooth, rounded; the membrane easily seen: the aperture large and gular.

The *trunk*. The back quite straight, a little rounded, the sides compressed; the abdomen carinate, but serrated, differently from the others, by small fibres. The branchial denticles very long. The lateral line middle, straight, faint. The anus remote.

The *fins*. The dorsal near the tail has sixteen slender, declining rays, the points extending beyond the edge of the membrane; the pectoral low, with twelve or fourteen rays, acuminate above, and a large lanceolate squama at the root; the ventral middle, of six very slender, short rays; the anal commences opposite to the dorsal, of the same shape, but twice as long; the caudal fin strong, bifid, two inches in length.

WAHLAH

The *colour* of the crown green and blue, the face and opercula splendent white; the ridge of the back a rich azure, below which are several green fillets; the rest a bright leaden. The pectoral and caudal fins glassy, the others light.

	Inches.	Lines.
The *length* from the rostrum to the tail - - -	10	0
of the caudal fin - - - - -	2	0
Breadth from the back to the abdomen - - - - -	1	9
Where narrowest - - - - - - -	0	11

REMARKS.

This fish never appears at the European tables, but is esteemed by the natives.

No. CC.

CLUPEA *corpore sub-cultrato: pinna ani caudali unita.*

The CLUPEA of a shape somewhat knife-form; the anal fin united with the caudal.

Clupea Mystus Linn. S. N. p. 524.

Called by the Natives QUALA PARAGAH.

B. x. *D.* 13. *P.* 16. *V.* 7. *A.* 62. *C.* 16.

THE *body*, particularly the hinder part, more of a knife-form than that of the herring, pellucid, white, the scales orbicular, deciduous.

The *head* ovate, compressed, the crown grooved, the rostrum obtuse. The mouth oblique, wide; the lower jaw shortish, truncate; the upper has a short retroflex process. Teeth very small. The tongue and palate smooth, the latter very red. Eyes supreme, near the rostrum, orbicular; nostrils double or divided by a valve. The branchial opercula two-leaved, thin; the membrane half discovered; the aperture arched.

The *trunk*. The back almost straight, convex, the sides compressed; the abdomen prominent, carinate, serrated. The branchial denticles long, setaceous; lateral line high, straight; the anus middle.

The *fins*. The dorsal nearly middle, small, with thirteen assurgent rays; the pectoral low, with sixteen rays, of which six are very long and setaceous; the ventral exceedingly small; the anal arising near the anus is continued to and joined with the caudal; caudal long, lanceolate, somewhat oblique, with about sixteen rays.

The *colour*. The head silvery; the rest resplendent white, with a row of silver dots under and parallel to the lateral line, on each side. The fins light, or glassy.

Length, five inches and a half.

No. CCI.

CLUPEA *corpore lanceolato; processu maxillæ superioris retroflexo, setoso, longissimo.*

The CLUPEA with a lanceolate body; a retroflex, setous process of the upper maxilla, extremely long.

Clupea Setirostris, Linn. Ed. Gmel. p. 1407.

Called by the Natives YEKA POORAWAH.

B. xii. *D.* 13. *P.* 13. *V.* 7. *A.* 25. *C.* 20.

THE form of the body lanceolate; but in most of the other characters, the deciduous scales, the oblique mouth, opercula, branchiæ, &c. it agrees with the genus; the lateral line nearly middle. What chiefly distinguishes it is the length of the maxillary process, which is as long as half the body.

The *fins*. The dorsal middle, short, consisting of thirteen declining rays; the pectoral low, small, acuminate above; the ventral of the same form, small; the anal opposite to the posterior part of the dorsal, with twenty-five declining rays; the caudal bifid, the lower lobe longer than the upper.

The *colour* omitted in my memoranda; but to the best of my recollection, it was that of the herring. I found it at Bimblipatam, when my painter was not in the way to make a drawing.

The *length*, four inches.

REMARKS.

This species was found also by Forster in the Pacific Ocean; and an accurate description with a figure has been given by Broussonet, from a specimen in the British Museum.*

No. CCII.

CLUPEA? *corpore lanceolato; membrana branchiale radiis octodecem; abdomine nec carinato nec serrato.*

The CLUPEA with a lanceolate body; a branchial membrane of eighteen rays; the abdomen neither carinate, nor serrated.

Called by the Natives MARRAWA.

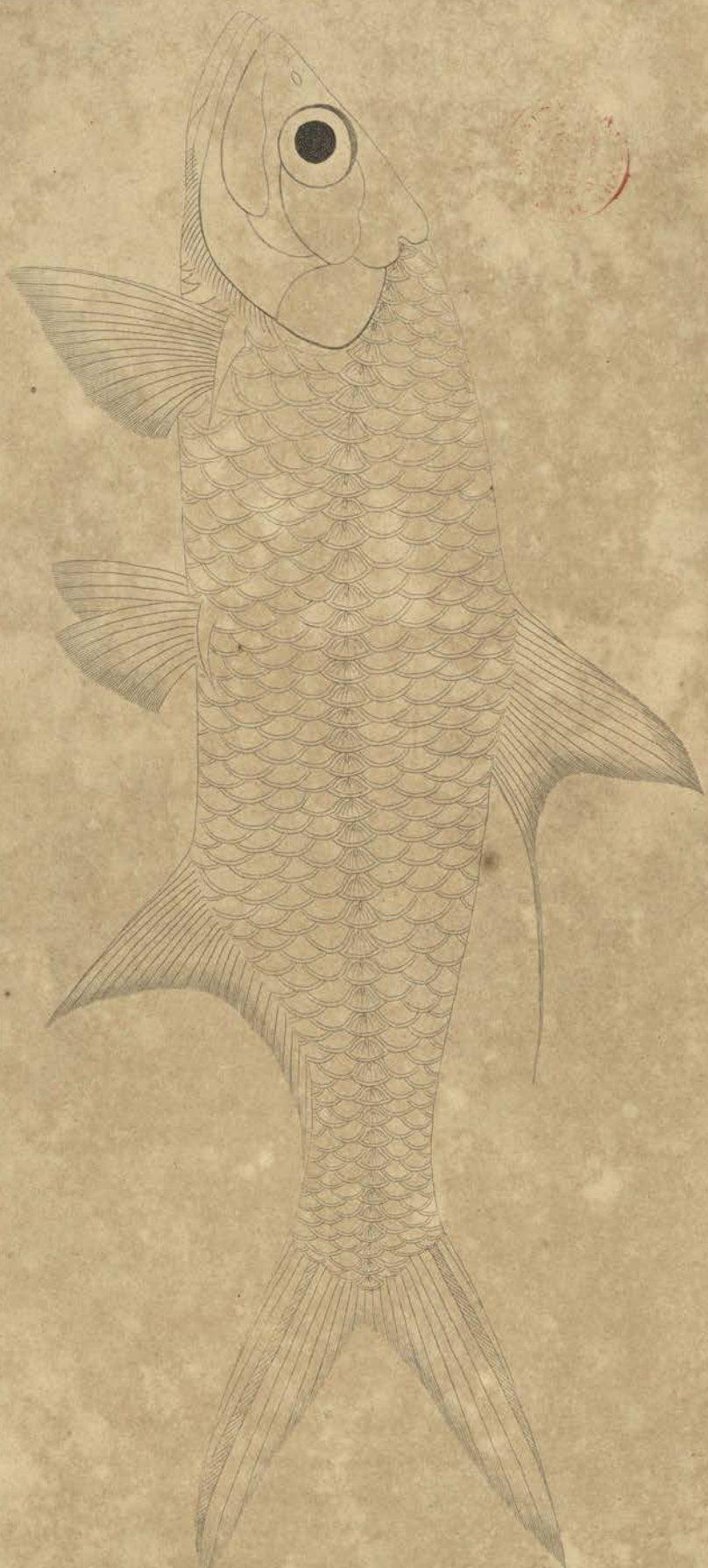
B. xviii. *D.* 16. *P.* 14. *V.* 9. *A.* 15. *C.* 18.

THIS, in its form as well as in colour, resembles the herring, only that the head is more richly gilded. The mouth, teeth, tongue, eyes, and opercula as in the last. The back nearly straight, sides and tail compressed, the breast carinate, the abdomen thin, but convex: neither of them serrated. The denticules of the branchiæ setaceous and long; the lateral line hardly perceptible.

The *fins*. The dorsal nearer the tail than the head, with sixteen declining rays; the pectoral low; the ventral has nine short rays; and the anal, opposite to the dorsal, fifteen very slender rays; the caudal bifid.

The *length*, seven inches.

* Brouss. Ichth. Fasc. I. Lond. 1782.



KUNDINGA

REMARKS.

The number of branchial rays, and the carina of the abdomen not serrated, are remarkable deviations from the character of the Clupea, if the present subject belongs to that genus. An accident prevented my getting a drawing made of it.

No. CCIII.

CLUPEA *corpore oblongo, squamis permagnis; radio ultimo pinnæ dorsi longo, setaceo.*

The CLUPEA with an oblong body; very large scales; the last ray of the dorsal fin long and setaceous.

Clupea Cyprinoides, Linn. Ed. Gmel. p. 1407.

Called by the Natives KUNDINGA.

B. xxiii. *D.* 18. *P.* 15. *V.* 9. *A.* 25. *C.* 26.

THE *body* oblong, compressed, smooth; scales very large, orbicular, with a white, membranous margin.

The *head* declivous, compressed, without scales; the front depressed, furrowed; the rostrum obtuse. The mouth low, a little oblique, large; no lips. The upper jaw extractile, the lower ascendent, truncate: both rough like a file. Tongue small, ovate, loose, and, as well as the palate, rough. Eyes supreme, very large, orbicular, covered with the common skin. Nostrils double, the anterior small, round, the posterior oval. The branchial opercula two-leaved, rounded, smooth, shining; the membrane exposed, with twenty-three slender ossicles; the aperture large, covered below by the membrane.

The *trunk*. The back slightly arched, a little rounded; the sides compressed, convex; the breast and abdomen straight, almost plane, not carinate nor serrated. The denticles of the exterior branchiæ very long, the others decreasing gradually in length. The lateral line bends down at first towards the pectoral fin, afterwards becomes middle and straight: very conspicuous, from the scales being singularly striated. The anus remote, linear.

The *fins*. The dorsal in the middle of the back consists of seven assurgent and eleven declining rays, of which the last is setaceous, three inches in length; the pectoral low, large, acuminate above; the ventral of the same shape: both have a large, sharp, sub-falcate squama at their roots; the anal fin remote, sub-lunate, the first and last ray slightly setaceous; the caudal fin deeply bifid.

The *colour*. The upper part of the head and front greenish; the face and opercula bright silver and golden. The back changeable like that of a herring; below the line pearl-colour; the breast and belly mother-of-pearl. The dorsal and caudal fins a little darkish; the others glassy or light.

	Inches.	Lines.
The *length* from the nose to the tail - - -	10	4
to the branchial aperture - -	2	6
of the caudal fin - - - - - -	2	8

REMARKS.

The serrated carinæ of the abdomen forming a principal generic character of the Clupea, the want of it in this and the preceding species, left me doubtful whether they were properly placed here: the agreement, however, in other characters (the remarkable difference in the number of branchial ossicles excepted,) induced me not to separate them from this genus.

Having since my return from India, found that the Clupea Cyprinoides, notwithstanding the number of branchial ossicles, and the smooth abdomen, had been admitted by Bloch and Gmelin, I have no remaining doubt of the Marrawa being a Clupea.

CYPRINUS.

GENERIC CHARACTER.

Caput ore edentulo; os nasale bisulcum. Membrana branchiostega radiis tribus. Corpus læve albens. Pinnæ ventrales sæpe novem radiatæ.

The head: mouth without teeth; the nasal bone forked. Three rays in the branchial membrane. The body smooth and whitish. Nine rays often in the ventral fins.

No. CCIV.

CYPRINUS *cirris quatuor; pinna dorsalis radiis undecem, tertio longo, crasso, rugoso, postice serrato; pinnis omnibus flavescentibus.*

The CYPRINUS with four cirri; eleven rays in the dorsal fin, of which the third is long, thick, rough, and on the hinder part serrated. All the fins have a yellowish cast.

Called by the Natives KUNNAMOO.

B. iii. *D.* $\frac{3}{11}$. *P.* 15. *V.* 9. *A.* 9. *C.* 20.

THE *body* oblong-ovate, compressed, squamous, resplendent; scales large, the base truncate, the posterior margin rounded, ciliate, imbricate, tenacious.

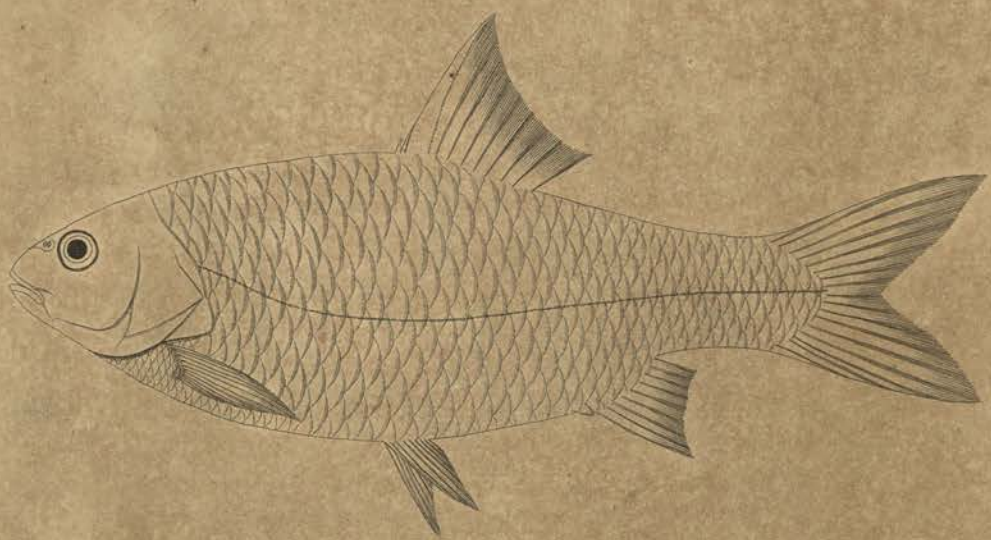
The *head* small, declivous, compressed, obtuse, without scales, the front a little convex, smooth. Mouth small, round, somewhat oblique; the lips thickish. Jaws extractile, the under a little shorter, both without teeth. Tongue short, roundish, smooth, tied. The palate smooth. The eyes high, round, plane; nostrils oval, contiguous, near the edge of the rostrum. The branchial opercula three-leaved, the middle leaf round, the first and third angular. The membrane has three stout ossicles; the aperture lateral, large, arched. The cirri very short; one on the upper lip, and one at the corner of the mouth, on each side.

The *trunk*. The back and abdomen arched, the former somewhat carinate, the latter convex; the sides and tail compressed. Branchiæ pectinate, and tuberculate. Lateral line from the edge of the opercula bends gently downwards to the end of the anal fin, then rising, it runs straight and middle to the tail. The anus very remote.

The *fins*. The dorsal middle, consists of three spinous, and eight single rays, the first of the spinous very short but sharp, the second lies close on the third, which is the longest, strong, a little curve, serrated behind, and rough on the side; the pectoral fin low, acuminate in the middle; the ventral opposite to the dorsal, also acuminate; the anal close to the anus, very near the tail; the caudal fin bifid.

The *colour*. The head, back, and sides a shining white; the throat and belly a yellowish white. The fins whitish with a faint yellow tint.

Length six inches.—Found in the river, and also in a tank at Casemcottah.



KINNAMOO

No. CCV.

CYPRINUS *corpore oblongo; cirris quatuor; pinna dorsi radiis octo, secundo serrato.*

The CYPRINUS with an oblong body; four cirri; eight rays in the dorsal fin, of which the second is serrated.

Called by the Natives KAKOO, or KAROO.

B. iii. *D.* $\frac{2}{8}$. *P.* 12. *V.* 9. *A.* 7. *C.* 20.

THE *length* six inches.

This species approached very near to the Cyprinus Barbus. The principal difference was in the number of dorsal and pectoral rays: in all other respects it agreed with the Barbel.

It was found in a tank near Tartoor.

No. CCVI.

CYPRINUS *corpore ovato, argenteo; cirris quatuor, duo ad nares, duo ad rictus angulos.*

The CYPRINUS with an ovate body, silver colour; four cirri, two at the nostrils, and two at the corner of the mouth.

Called by the Natives KADOON.

B. iii. *D.* $\frac{1}{11}$. *P.* 14. *V.* 9. *A.* 8. *C.* 20.

THE *body* ovate, compressed, squamous, scales somewhat rounded, square-form, large, ciliate, deciduous.

The *head*, mouth, jaws, tongue, palate, branchial membrane and aperture as before described in No. CCIV. The eyes nearly middle; the opercula rounded, the last lamina with a ciliate margin. Two of the four cirri from the corner of the mouth, the other two from the nostrils.

The *trunk*. The back less arched than the abdomen; sides and tail compressed. The lateral line, without bending down, as in the Kunnamoo, sloped gently before it became straight near its termination.

The *fins*. The dorsal nearly middle, declining, with one short spine; the pectoral low, small; the ventral a little more advanced than the dorsal; the anal remote, declining; the caudal fin bifid.

The *colour*. The back a little darkish; the head and sides a dull silver, but splendent; the throat and belly white; the fins darkish, yet less so than the back.

The *length* eight inches.—Caught in the lake at Ankapilly. There was no opportunity of making a drawing.

No. CCVII.

CYPRINUS? *corpore elongato, lanceolato; pinna ventralis radiis undecem; squamis insolitæ formæ ad nuchas, pinnasque dorsi et ani.*

The CYPRINUS with an elongate, lanceolate body; eleven rays in the ventral fin; scales of an unusual shape on the shoulder, and at the roots of the dorsal and the anal fin.

Called by the Natives PALAH BONTAH.

B. iv. *D.* 14. *P.* 16. *V.* 11. *A.* 9. *C.* 28.

THE *body* long, lanceolate, compressed, squamous, resplendent. Scales large, scallop-shape, striated, above the lateral line; but smaller and not striated under it. On the shoulder they are of a singular form: oblong, roundish, acuminate at both ends, and placed obliquely; smaller scales of a pear-shape, acuminate, the point a little curve, are found at the roots of the dorsal and anal fins, one to each ray.

The *head* narrower than the body, conical, compressed, without scales. The front gently declivous, a little depressed, smooth. The mouth small, with very thin lips. The jaws rather short, hardly extractile; the superior longer, emarginate, covering the under, which is carinate; both are destitute of teeth. Tongue short, obtuse, smooth, fixed, sheathed. Palate smooth. Eyes very large, near the rostrum, orbicular, covered by the skin of the head. A nostril divided by a valve, between the rostrum and orbit. Branchial opercula rounded, resplendent, without scales; the branchial membranes joined, each having four rays; the aperture arched, lateral.

The *trunk.* The back less arched than the abdomen; the sides convex but compressed; the diminution of the tail owing more to the form of the lower parts, than to the declension of the back. Branchiæ pectinate. The lateral line bends down a little towards the pectoral fin, then straight and middle to the end. The anus remote.

The *fins.* The dorsal nearly middle, sub-falcate; points of the lobes setaceous. The pectoral very low, long, broad, pointed above; the ventral opposite to the dorsal: both have a large, lanceolate squama at their rise. The anal remote, somewhat falcate, like the dorsal; the caudal fin long and deeply bifid.

The *colour.* The crown and front green, the face and opercula mother-of-pearl; the back changeable, dark green, and blue. The sides below the line, and the belly, mother-of-pearl. The dorsal and caudal fins darkish green, the others whitish.

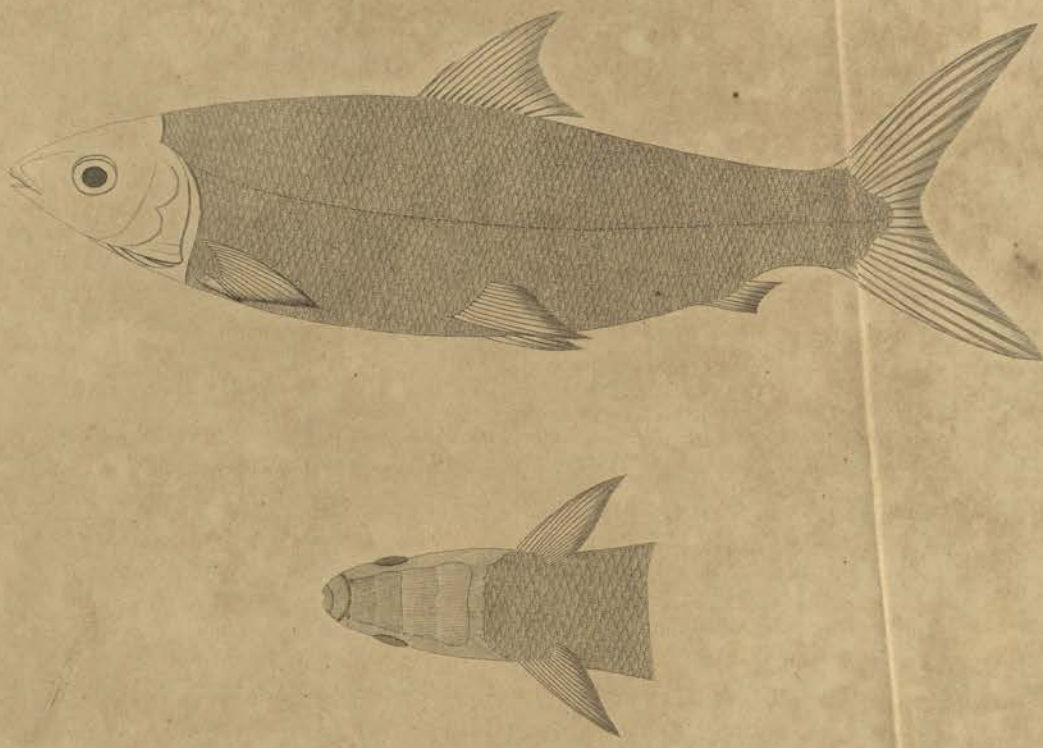
	Feet.	Inches.
The *length* from the rostrum to the tail - -	1	3
to the dorsal fin - - - -	0	7
to the edge of the opercula - -	0	3
of the caudal fin - - - -	0	3

REMARKS.

This fish is frequently brought to the English tables under the name of Milk Mullet, but is much inferior to the Gray Mullet.

PALAH BONTAH

R.



TODLELOO

No. CCVIII.

CYPRINUS? *corpore lanceolato, aurato; radiis dorsalibus quindecem; pinnis omnibus viridiscentibus.*

The CYPRINUS with a lanceolate body of a golden colour; fifteen dorsal rays; all the fins of a greenish cast.

Called by the Natives TOOLELOO.

B. iv. *D.* 15. *P.* 15. *V.* 11. *A.* 9. *C.* 24.

THE *body* lanceolate, compressed, squamous, the scales small, suborbicular, ciliate, imbricate, tenacious.

The *head* ovate, compressed, without scales; the crown and front a little depressed, striate, the rostrum obtuse, emarginate, short. The mouth small, roundish, lips simple. The jaws, when shut, nearly of equal length, short, very little extractile, without teeth. The tongue and palate smooth, the former very small, hardly moveable. The eyes middle, orbicular, covered with the common skin. The nostrils very small, on the edge of the rostrum, single, divided by a valve. The opercula two-leaved, without scales, one angular, the posterior rounded; the branchial membrane has four ossicles; the aperture lateral.

The *trunk*. The back rather less arched than the abdomen, both are a little rounded, not carinate; the sides and tail compressed; the latter somewhat roundish near the fin. The branchiæ four-leaved, pectinate. The lateral line bends at first parallel to the belly, afterwards middle and straight to its termination. The anus remote.

The *fins*. The dorsal centrical, in shape somewhat lunate, has fifteen or sixteen rays; the pectoral low, acuminate above, and a lanceolate squama beneath each; the ventral broad, as long as the pectoral, distant, acuminate above; the anal very small, lunate like the dorsal, remote; the caudal fin deeply bifid.

The *colour*. The head a yellowish green; the opercula and trunk a gold colour; the fins the same colour with the head.

The *length* nine inches.

REMARKS.

The subject described was received in spirits from Madepollam, in the month of September. It was known under the name of Mountain Mullet at Madepollam, from being found in the river only when the freshes come down; and never caught in the sea outside of the surf. It was represented to be a well tasted fish, but full of small bones.

The specimen sent to me was not accompanied with any description. The golden colour appeared to be in tolerable preservation: the other colours had probably suffered some alteration from the spirits.

It should be remarked of the present subject and the fish immediately preceding it, that the branchial membrane contains four ossicles; in which respect both deviate from the generic character of Cyprinus: their agreement with the genus in some other respects obtained them a temporary place here.

SYSTEMATICAL INDEX

TO VOLUME II.

PISCES THORACICI.

Names at Vizagapatam.		Page	*Names at Madras.*
SPARUS.			
No.			No.
101	Kooroota	1	101
102	Worahwah	2	102
103	Worahwah	3	103
104	Sullaneroo Kunte	ib.	104 Candal.
105	Botche	4	105
106	Kurite	5	106 Mattewai.
107	Lama Guliminda	6	107
108	Chundawah	ib.	108
109	Pottee Kanasah	7	109
110	Mungi Mupudi	8	110
111		ib.	111
112		9	112
113	Soring	ib.	113
114	Mangula Kutti	10	113
LABRUS.			
115	Nalla Katchelee	11	115 Kora Katchili.
116	Katchellee	12	116 Kathala.
117	Tella Katchelee	13	117 Puruva.
118	Qualer Katchelee	ib.	118
119	Sahnee Moi	14	119
120	Sahnee Moi	15	120
PERCA.			
121	Paikeeli	16	121 Woodan.
122	Doondiawah	17	122 Coduvan.
123	Sarikulla	ib.	123 Kormin.
124	Caripe	18	124 Varykathala.
125	Karooi	19	125 Peramkendal.
126	Keelputa	ib.	126 Kokachan.
127	Bontoo	20	127 Pannymin.
128	Madinava Bontoo	22	128 Shambarum Punny.
129	Rahtee Bontoo	ib.	129 Panni Chitta.
130	Saggalatoo Bontoo	23	130
131	Pandomenoo	ib..	131 Kala.
132	Guoraka	24	132
GASTEROSTEUS.			
133	Kodipungi.	25	133

PISCES THORACICI.

Names at Vizagapatam.		Page	*Names at Madras.*
SCOMBER.			
No.			No.
134	Wingeram	26	134 Venjeram.
135	Konam	27	135
136	Kanagurta	28	136
137	Toloo Parah	29	137
138	Tol Parah	ib.	138 Tole Perra.
139	Kurra Wodagawah	30	139
140	Tala Parah	ib.	140 Tela Parra.
141	Aken Parah	31	141
142	Botla Parah	32	142
143	Woragoo	33	143
144	Gundi Parah	ib.	144 Rahara.
145	Kurugoo Parah	34	145 Parum Parra.
146	Ecalah Parah	35	146 Sengada Parra.
147	Yarradanree Parah	ib	147
148	Wotim Parah	36	148
149	Poloosa Parah	ib.	149 Pile Para.
150	Tallam Parah	37	150
151	Tchawil Parah	38	151 Talan Para.
152	Mais Parah	ib.	152
153	Pedda Mottah	39	153
154	Mookalee Parah	ib.	154 Katalie.
155	Wori Parah	40	155 Kadammora.
156	Mitta Parah	41	156
MULLUS.			
157	Rahti Gulivinda	42	157 Kandal.
158	Bandi Gulivinda	43	158 Navera.
TRIGLA.			
159	Worrah Minoo. A	44	159 Curptombe.
160	Worrah Minoo. B	45	160 Thembee.
161	Mooree Godoo	ib.	161
OPHICEPHALUS.			
162	Muttah	47	162 Varaloo.
163	Sowarah	48	163
164	Korah Mottah	49	164

PISCES ABDOMINALES.

Names at Vizagapatam.		Page	*Names at Madras.*
SILURUS.			
No.			No.
165	Wallagoo	50	165
166	Ingeelee	51	166 Akalda.
167	Chintah Jellah	52	167 Vallakelda.
168	Marpoo	53	168 Talle.
169	Deddi Jellah	54	169 Vultukuldu.
170	Nalla Jellah	55	170 Nadumakelda.
171	Wana Motta	ib.	171 Vangaravashe.
SALMO.			
172	Badi Mottah	56	172 Alali.
FISTULARIA.			
173	Goorum	58	173
ESOX.			
174	Jellow	59	174
175	Wahlah Kuddera	60	175 Colaushe.
176	Kuddera. A	61	176
177	Kuddera. B	ib.	177
178	Kuddera. C	62	178
ELOPS.			
179	Jinagow	63	179
MUGIL.			
180	Bontah	64	180
181	Kunnesee	65	181
182	Peddaraki Sovere	66	182

PISCES ABDOMINALES.

Names at Vizagapatam.		Page	*Names at Madras.*
POLYNEMUS.			
No.		Page	No.
183	Maga Jellee	67	183
184	Maga Booshee	68	184
185	Tupsee Mutchey	69	185 at Bengal.
CLUPEA.			
186	Kowal	70	186
187	Nattoo	71	187
188	Ditchelee	72	188
189	Poorawah	ib.	189
190	Pedda Poorawah	73	190
191	Jangarloo	ib.	191
192	Ditchoee	74	192
193	Tartoore	ib.	193
194	Poorwa	75	194
195	Keelee	ib.	195
196	Kome	76	196
197	Pedda Kome	77	197
198	Palasah	ib.	198 Kilsi Matchi at Bengal.
199	Wahlah	78	199
200	Quala Paragah	79	200
201	Yeka Poorawah	80	201
202	Marrawa	ib.	202
203	Kundinga	81	203
CYPRINUS.			
204	Kunnamoo	82	204
205	Kukoo	83	205 Rui Matchi at Bengal.
206	Kadoon	ib.	206
207	Palah Bontah	84	207
208	Tooleloo	85	208

ALPHABETICAL INDEX

TO VOLUME II.

Names at Vizagapatam.	Page	*Names at Madras.*	No.
A.			
Aken Parah	31	Akalda	166
		Alali	172
B.			
Badi Mottah	56		
Bandi Goolivinda	43		
Bontoo	20		
Bontah	64		
Botche	4		
Botla Parah	32		
C.			
Caripe	18	Candal	104
Chinta jellah	52	Coduvan	122
Chundawah	5	Colaushe	175
		Curptombe	159
D.			
Deddi jellah	54		
Ditchelee	72		
Ditchoee	74		
Doondawah	17		
E.			
Ecalah Parah	35		
G.			
Goorum	58		
Gundi Parah	33		
Guoraka	24		
I.			
Ingeelee	51		
J.			
Jangarloo	73		
Jinagow	63		
Jellow	59		
K.			
Kadoon	83	Kala	131
Kanagurta	28	Kandal	157
Kakoo or Karoo	83	Kathala	116
Karooi	19	Koduwamin	120

Names at Vizagapatam.	Page	*Names at Madras.*	No.
K *continued.*			
Katchelee	12	Kokuchan	126
Keelee	75	Kora Katchili	115
Keelputa	19	Kormin	123
Kodipungi	25	Kudammora	155
Kome	76	Kutalie	154
Konam	27		
Kora Motta	49		
Kowal or Kowarloo	70		
Kooroota	1		
Kuddera A	61		
Kuddera B	ib.		
Kuddera C	62		
Kunnamoo	82		
Kunnesee	65		
Kundinga	81		
Kurite	5		
Kurra Wodagawah	30		
Kurugoo Parah	34		
L.			
Lama Guliminda	6		
M.			
Madinawa Bontoo	22	Malawai	106
Maga Booshee	68		
Maga Jellee	67		
Mais Parah	38		
Mangula Kutti	10		
Marrawa	80		
Marpoo	53		
Mittah Parah	41		
Mookalee Parah	39		
Mooree Godoo	45		
Mungi Mupudee	8		
Muttah	47		
N.			
Nalla Jellah	55	Nadumkelda	170
Nalla Katchelee	13	Navera	158
Nattoo or Nettooli	71		
P.			
Paikeeli	16	Pannymin	127
Palasah	77	Pannychitta	129

ALPHABETICAL INDEX.

Names at Vizagapatam.	Page	*Names at Madras.*	No.
P *continued.*			
Palah Bontah	84	Param Parra	145
Pandoomenoo	23	Peramkenda	125
Peddaraki Sovere	66	Pile Parra	145
Pedda Kome	77	Puruva Kathala	117
Pedda Mottah	39		
Peddah Poorawah	73		
Poloosoo Parah	36		
Pottee Kanasah	7		
Poorwa	75		
Poorawah	72		
Q.			
Qualar Katchelee	13		
Quala Paragah	79		
R.			
Rahtee Bontoo	22	Rahara	144
Rahti Goolivinda	42		
S.			
Sahnee Moia	14	Sengada Parra	146
Sahnee Moia	15	Shambaram Punny	128
Sari Kulla	17		
Soring	9		
Sowarah	48		
Suggalahtoo Bontoo	23		
Sullaneroo Kuntee	3		
T.			
Tala Parah	30	Tala Parra	140
Tallam Parah	37	Talle	168
Tartoore	74	Talam Parra	151
Tella Katchelee	13	Thembee	160
Tol Parah	29	Tole Parra	138
Toloo Parah	ib.		
Tooleloo	85		
Tupsee Mutchey	69		
Tehawil Parah	38		
V.			
		Vallakelda	167
		Vangaravashe	179
		Varaloo	162
		Varykathala	124
		Venjeram	134
		Vultukulda	169
W.			
Wahlah Kuddera	60	Woodan	121
Wahlah	78		
Wallagoo	50		
Wana Motta	55		
Wingeram	26		
Worrah Minoo A	44		
Worrah Minoo B	45		
Woragoo	33		
Worahwah	2		
Worahwah	3		
Wori Parah	40		
Wotim Parah	36		
Y.			
Yarradanree	35		
Yeka Poorawah	80		

ERRATA.

VOL. I. Preface, Page vi. line 7 from bottom, for St. Toma, *read* St. Thome.

VOL. II. Page 21. No. 127. Line 8. Perka, *read* Perca.
—— 71. — 187. —— 3. Shewers, —— Skewers.

The Descriptions of the following Numbers are not accompanied with Figures:

No.
CLXIV.
CC.
CCI.
CCII.
CCV.
CCVI.

FINIS.

Printed by W. Bulmer and Co.
Cleveland-row, St. James's.

00140562

Digitized with financial assistance from
Observer Research Foundation
on 22 February, 2019